

ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED  
FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS)

Form 1600-1

Rev. 6-2001

Department of Natural Resources (DNR)

SCR -

Type List Designation

NR 150.03(8)(f) 2.a. and 9.a.

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision.

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## PROJECT SUMMARY

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The following environmental assessment (EA) has been prepared to address reissuance of the Wisconsin Pollution Discharge Elimination System (WPDES) permit and a modification of the existing Chapter 30 permit pertaining to a discharge to the Wisconsin River and an associated intake structure on Mud Lake. The Department of Natural Resources (DNR) should have written an EA when the WPDES permit was first issued in 2002. This was an oversight on the Department's part. The Department does not normally do after-the-fact EA's. However, in this case we determined an EA was warranted after hearing the comments at the public hearing for the WPDES permit on Thursday, January, 22, 2009. This EA describes the decision process for the reissuing the WPDES Permit and modifying the Chapter 30 permit.

### 1. Brief overview of the proposal including the DNR action

The Fish, Mud, Crystal Lake District (hereafter referred to as the "Lake District" or "District") has applied to the Department of Natural Resources (DNR) for reissuance of an existing WPDES permit (WI-0049964) to discharge additional water (increased pumping capacity) and a modification to an existing Chapter 30 permit (3-SC-2002-13-4127LW) to allow for year round pumping from Fish and Mud Lake, located in Sections 3 & 4, Town of Roxbury, Dane County, directly to the Wisconsin River in order to control high water levels and prevent flooding impacts to residences and infrastructure. The application requests approval to divert approximately 900 gallons per minute (gpm) (approximately 400 gpm more than the original permit) through buried pipeline from the southwest corner of the Mud Lake to the Wisconsin River (see map in the appendix). The permit modification would allow the District to attempt to lower the water level of Fish and Mud Lake to the Ordinary High Water Mark of 858.7 ft. MSL.

In this document, the overall pumping proposal will be described and evaluated instead of just the above mentioned changes to the WPDES and Chapter 30 permits.

In 2002, a permit was issued to the Town of Roxbury that allowed for a direct discharge of water to the Wisconsin River. Pollutant limits for Biochemical Oxygen Demand (BOD), suspended solids, ammonia and phosphorus were set equal to the Wisconsin River sample result value for that day. The permit required same-day sampling of the discharge and the Wisconsin River for (BOD), suspended solids, ammonia, pH, dissolved oxygen and phosphorus. No actual discharge to the Wisconsin River occurred under this initial permit issuance, because the Chapter 30 permit was not issued, which would allow for installation of the pump.

A Chapter 30 permit was issued in 2005, which would allow the District to construct the pump and place the intake on the bed of Mud Lake and pump to an infiltration ditch located on state property adjacent to Clifton Road (see map), which is part of the Lower Wisconsin State Riverway. Easements were obtained from landowners and permits and approvals were obtained from Dane County (Floodplain and Shoreland Zoning, Construction Site, and Stormwater-NR 216). A land use agreement was obtained from the state and a permit was also obtained from the Lower Wisconsin State Riverway Board to allow for the construction of the infiltration ditch. The pumping apparatus, pipeline and infiltration trench were all part of the pumping system that was designed by Mead and Hunt and subsequently approved and implemented by the Lake District.

## 2. Purpose and Need (include history and background as appropriate)

The water level of Fish and Crystal Lake has risen 9 feet since 1966 (USGS, 2002), and has inundated homes and roads that border Fish Lake. The higher water level has also impacted shoreline residences at Crystal Lake. In 2000 the residents on both lakes started to explore ways to address the situation. In 2001, after numerous meetings with citizen groups, a process to identify an alternative to address the flooding was facilitated by UW Extension. The Roxbury Township was granted a WPDES permit to discharge pumped water from Fish Lake to the Wisconsin River (2002). Water that would be pumped into the Wisconsin River from Fish Lake according to the permit issued had to meet the background water quality of the Wisconsin River (classed as an Exceptional Resource Water). In 2002, USGS also issued their study of the situation, which stated that pumping 500 gpm of Fish/Mud Lake for one year would reduce water level just over one-foot—Crystal Lake would be reduced less than 0.2 feet (USGS, 2002). It should also be noted that Dane County submitted a preliminary application to request \$1,200,000 from FEMA for funding to provide a relocation option to residents. Landowners choose not to avail themselves of that opportunity to address flooding of their homes by accepting a voluntary “buyout” and moving away.

In 2003, Mead and Hunt issued a proposal with recommendations for establishing a pumping system. Ultimately, it was decided that a pump would be installed that would draw water from Mud Lake. It was the recommendation of the Department to avoid pumping from Fish Lake because the water from Mud Lake had poor water quality and would be drawn into Fish Lake and possibly impact the better water quality of Fish Lake. At this time funding was made available to Roxbury Township from the State Legislature (\$200,000), and local governments (\$65,000) (Roxbury and West Point Townships and Dane County) that would defray costs of building a pumping system. The Fish, Crystal and Mud Lake District was also formed at this time (2003) and at that time assumed administration of funding and permitting of this project.

A Chapter 30 permit was issued in 2005, which would allow the District to construct the pump and place the intake on the bed of Mud Lake, and begin pumping to an infiltration ditch located on state property adjacent to Clifton Road (see map), which is also part of the Lower Wisconsin State Riverway. At the time, there were concerns expressed by the US Fish and Wildlife Service (FWS) regarding a possible discharge to the Wisconsin River and the impacts to the federally endangered Higgin's Eye Pearly Mussel. Subsequently, it was determined that those mussels inhabit a reach of the river that is upstream of the discharge pipe. Easements were obtained from landowners, and permits and approvals were obtained from WDNR, Dane County (Floodplain and Shoreland Zoning, Construction Site, and Stormwater-NR 216). A land use agreement was obtained from the state and a permit was also obtained from the Lower

Wisconsin State Riverway Board to allow for the construction of the infiltration ditch. The pumping apparatus, pipeline and infiltration trench were all part of the pumping system that was designed by Mead and Hunt and subsequently approved and implemented by the Lake District. Relatively soon after the pumping commenced, the infiltration trench failed and the Lake District constructed unauthorized ditches to relieve flooding in the area of the infiltration ditch. The District was required to repair any site damage and was not allowed to proceed with pumping.

In 2007 the District proposed building a pilot infiltration pond system to determine if this method of disposing of the pumped water was feasible at all. If successful, the District would eventually apply for a permit to implement fully operational infiltration system. If they would choose to implement this system, they would be required to find suitable land for the Lower Wisconsin Riverway and trade that for the land they would use for the infiltration system. This would be done as a land trade requiring the Lake District to convey to the Department a parcel of land, of equal or greater value, based on an appraisal of fair market value. The trade would be subject to approval by the Natural Resources Board. The conveyed parcel would also be subject to deed restrictions and an easement for continuation of the existing snowmobile trail. The Lake District would then assume full responsibility for ownership, liability and management of the land and associated infiltration beds. There were many concerns about these proposed actions including groundwater contamination and disturbance of use of the area by Bald Eagles and other wildlife.

Per the Department's requirement, the Lake District held an informational meeting for local residents to update them on the Lake District's plans for pumping. One item of great concern to the adjacent neighbors is how this project would affect their private wells. They asked what recourse they would have if their wells were damaged. The Lake District sent letters to the owners stating if the "District negligently damages or contaminates a well, it will be responsible for the damage."

In 2007, the Lake District applied to and received from the Department coverage for discharges to the pilot infiltration system under a Short Duration Discharge General Permit (WI-0059137). In 2008, this Short Duration Discharge General Permit was issued to allow the District to begin discharging to the pilot infiltration cell. With the unprecedented amount of rainfall received during the month of June, the infiltration test was unsuccessful. Between the end of June and December 15 of 2008, the Department allowed the District to pump to the Wisconsin River on an emergency basis under the bypassing provisions of the General Permit.

In 2008, the District revised its 2006 application to the Department to reissue their original WPDES permit to allow them to increase the discharge to 900 gpm, and discharge to the Wisconsin River. For this permit, the Department recommends, as it did in the original permit, discharge limits for BOD and suspended solids of 20 and 40 parts per million (ppm), respectively, due to correction of public health issues and provision of economic relief, plus pH limits of 6 - 9 and monitoring for ammonia and phosphorus. A low flow of 2,200 cfs was used in the discharge limit calculations. The discharge flow from the outfall is from one to two cubic feet per second (cfs). This discharge flow is 0.1% of river low flow. The Wisconsin River assimilative capacity at this location for BOD is 1,812 ppm. The BOD limit for the discharge permit is 20 ppm based on best professional judgment.

The District has also applied to the Department to amend the Chapter 30 permit, which would allow them to discharge to the river all year long.

A public hearing was held on January 22, 2009 at the West Point Town Hall on the WPDES permit reissuance and the Chapter 30 permit amendments. Approximately 200 people attended and approximately 75 people commented on the proposed permit.

### 3. Authorities and Approvals (list local, state and federal permits or approvals required)

#### Department Approvals

Chapter 30 Permit (3-SC-2002-13-4127LW)  
Wisconsin Pollution Discharge Elimination System Permit (WI-0049964)  
Land Use Agreement (signed 4/7/09 by DNR)  
Stormwater Permit (NR 216)

State Approvals

State Historic Preservation Office  
Archeological

Federal Approvals

Fish and Wildlife Service

Local Approvals

Dane County Land Disturbance Permit  
Wisconsin Lower Wisconsin Riverway Board

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**PROPOSED PHYSICAL CHANGES** (more fully describe the proposal)

4. Manipulation of Terrestrial Resources (include relevant quantities - sq. ft., cu. yard, etc.)

Excavation for the existing 2.5 mile pipeline was completed in 2005. There is a diffuser on the intake (10 inch diameter holes in two locations on the inlet of the pipe). The pipeline route runs west from the pump station on Fish Lake Road under and alongside Haas Road, Inama Road and State Highway 188 before outletting at the north end of Clifton Road. (See Appendix).

The permittee now proposes to permanently extend this pipeline approximately 1,000 ft. further west to the bank of the Wisconsin River.

Manipulation of the landscape would involve excavation of a 1,000 ft. (approx.) trench for the pipe; tree and brush removal along the 15-foot corridor as needed; refilling and smoothing of the disturbed surface after pipe installation; and seeding the disturbed ground. The trench would be a maximum of 8 feet wide. The pipe will be a 12 inch high density polyethylene plastic pipe, which is flexible, and will have two feet of soil cover over it. The outfall will be located at the top of the river bank where a device will distribute the discharge to reduce its velocity to the river.

5. Manipulation of Aquatic Resources (include relevant quantities - cfs, acre feet, million gallons per day (MGD), etc.)

Manipulation of aquatic resources would occur in several areas during this project: the lake levels of Fish and Mud Lakes (and to a lesser extent, Crystal Lake), and the outlet structure on the bank of the Wisconsin River.

Lake Level and Flows: The proposed diversion system is primarily intended to keep Fish and Mud Lake levels from exceeding 858.7 feet mean sea level (MSL), which is the established Ordinary High Water elevation of Fish Lake. Lake levels could rise above this elevation because the volume that could be diverted is limited to 900 gpm.

Outlet to the Wisconsin River: The discharge pipe is designed to terminate on the bank of the Wisconsin River and will utilize a flow distribution device to minimize erosion to the river bank.

6. Buildings, Treatment Units, Roads and Other Structures (include size of facilities, road miles, etc.)

At the lake end, the pump inlet pipe is located along the south shore of Mud Lake, near Fish Lake Road (See Appendix). The pump wet well, meter manhole, electrical transformer and control panel are located about 1,200 feet south, near the entrance to Fish Lake County Park. The discharge pipe runs west from there for 2.5 miles to Clifton Road where it outlets. The proposal will extend the existing pipe 1000 feet to

the Wisconsin River where a distribution device will dissipate the energy of the discharge to the River.

7. Emissions and Discharges (include relevant characteristics and quantities)

The Lake water pumping rate is proposed to be increased from 550 to 900 gpm or 1.3 MGD.

During construction, there is potential for dust emissions, noise, and soil erosion along the entire 1,000-foot route from Clifton Road to the River. Also, groundwater or rainwater that enters excavated areas during construction would have to be removed to provide dry conditions for construction (particularly where concrete needs to be poured). This collected rain or groundwater would need to be pumped out and discharged on upland for seepage to groundwater (or other appropriate methods of discharge as allowed under a stormwater permit).

8. Other Changes

None anticipated.

9. Identify the maps, plans and other descriptive material attached

Maps, figures and other descriptive material is located in the appendix.

**AFFECTED ENVIRONMENT (describe existing features that may be affected by proposal)**

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10. Information Based On (check all that apply):

☒ Literature/correspondence (specify major sources)

Budd, J., R.A. Lillie, and P. Rasmussen. 1995. Morphological characteristics of the Aquatic macrophyte, Myriophyllum spicatum L., in Fish Lake, Wisconsin. Journal of Freshwater Ecology 10:19-31

Dane County Lakes and Watershed Commission, Wisconsin Department of Natural Resources, UW Madison Center for Limnology, United States Geological Survey, 1996, A Management Plan to Protect and Improve the Fish Lake Ecosystem

Dane County Regional Planning Commission. 1979. Dane County Water Quality Plan: Appendix B Water Quality Conditions. Madison, Wisconsin.

Hay, Robert. 2008-9, Bureau of Endangered Resources, Wisconsin Department of Natural Resources, Personal Communication,

Lillie, R.A. 1996. A quantitative survey of the floating leafed and submersed macrophytes of Fish Lake, Dane County, Wisconsin. Wisconsin Academy of Science, Arts, and Letters, Volume 84 (1996).

Lillie, R.A., G. Wegner and G. Quinn. 1997. Pretreatment Results of the Fish Lake Project. Bureau of Integrated Science Services, WDNR PUBL-SS-924-97

Marshall, D. 2007. Addendum to the 2007 Aquatic Plant Management Plan for Fish, Crystal and Indian Lakes, Dane County, Wisconsin.

Simulation of Fish, Mud, and Crystal Lakes and the Shallow Ground-Water System, Dane County, Wisconsin, USGS, 2002, Water-Resources Investigations Report 02-4014

WPDES, Stormwater, Land Use Agreement and Chapter 30 Permit applications and supporting materials submitted by Mead and Hunt, Town of Roxbury and the Crystal, Fish and Mud Lake District from 2001 to 2009

Unmuth, J.M.L., and M.J. Hansen. 1999. Effects of Mechanical Harvesting of Eurasian Watermilfoil on Largemouth Bass and Bluegill Populations in Fish Lake, Wisconsin. North American Journal of Fisheries Management 19:1089-1098.

☒ Personal Contacts

Field Analysis By: ☒ Author ☒ Other

Past Experience With Site By: ☒ Other

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**AFFECTED ENVIRONMENT (describe existing features that may be affected by proposal)**

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**11. Physical Environment (topography, soils, water, air)**

The project area lies in northwestern Dane County,. Fish, Mud (Marx Pond) and Crystal Lakes, as well as the Wisconsin River at the point of proposed discharge, are in the Roxbury Creek watershed. The area is characterized by wetlands, wooded ridges and agricultural lands on slopes in the vicinity of the lakes proposed for drawdown. Much of the land along the proposed pipeline is rolling to flat, and primarily in agricultural crops. In the vicinity of the proposed discharge at the Wisconsin River, the area is characterized by river terraces with floodplain forested wetlands, backwater sloughs, and wet mesic to dry mesic prairies. The dominant soils in the path of the proposed pipeline are moderately well drained to well drained silty loam soils on 0 to 6 percent slopes. Near the proposed discharge, soil permeability is moderate to moderately rapid and subject to occasional flooding. Air quality in the area is good, with no chronic sources of air contaminants.

The United States Geologic Survey (USGS) calculated the Wisconsin River flows at Station # LW 18 at Prairie du Sac, near the discharge point. The estimated low flows of 2,200 cfs for  $Q_{7,10}$ , were used to calculate water quality based effluent limitations in the Wisconsin River. The  $Q_{7,10}$  is defined as the lowest sustained seven day flow to occur in a 10 year period. This 2,200 cfs estimate was calculated based on low flow conditions, or what one would expect during near drought to drought conditions. Normal flows in the Wisconsin River are much higher.

**12. Biological Environment (dominant aquatic and terrestrial plant and animal species and habitats including threatened/endangered resources; wetland amounts, types and hydraulic value)**

Terrestrial Resources

Land Cover

The surrounding land use of Fish, Mud and Crystal Lakes is 64% agriculture, 29% broad leaved deciduous forests, and the remainder is wetlands, grasslands and residential. The watershed for Fish and Mud Lakes is

1,344 acres, and for Crystal Lake it is 3,697. The watersheds lie in Dane and Columbia Counties. Acquisition of a large portion of Fish Lake shoreline by Dane County, and creation of Lussier Park has protected most of the north-east shoreline. Approximately 90% of the proposed pipeline route passes through agricultural fields of mainly corn, soybeans, alfalfa and clover, and the remainder is routed through roadside ditches, dry prairie, forested floodplain and wetlands. Emergent wet meadow wetlands and standing water exist along the boundary of Mud Lake at the site of the intake pipe.

The discharge is proposed to outlet on the bank of the Wisconsin River in Dane County. The land cover in the vicinity of the pipe and near the outlet is a mix of dry mesic prairie and forested floodplain on Lower Wisconsin State Riverway property. The forested floodplain is dominated by trees, shrubs and vines including silver maple, green ash, locusts, black oak, cottonwood, hackberry, American and slippery elms, European buckthorn, prickly ash, honeysuckle, wild grape, raspberry, and sandbar willows near the Wisconsin River shoreline. The sub-canopy trees are mainly silver maple, green ash, box elder, black locust, and American elm. The latter of which appears to be dying. The ground cover is dominated by silver maple seedlings, asters, white snakeroot, goldenrods, mints, and a variety of grasses and sedges. Dry mesic prairie ground cover is dominated by big bluestem, switch and indian grasses, white sage, dotted mint, Canada goldenrod and ragweed. There are a few bur and black oaks of various sizes, and invasions of red cedar, a native but weedy tree of prairies. This area has been frequently disturbed by a snowmobile trail, ATV's and other vehicles, and these areas are dominated by Canada goldenrod, bouncing bet, dames rocket, gill over the ground, motherwort, wild mint, sheep sorrel, and small red cedar trees.

## Aquatic Resources

### Mud, Fish, and Crystal Lakes

Mud Lake is a hypereutrophic (very fertile) 76 acre seepage lake, and has a maximum depth of 7.6 feet and average depth of 4.2 feet. Hypereutrophic lakes are very nutrient-rich lakes characterized by frequent and severe nuisance algal blooms and low transparency. For more than a decade Mud Lake has experienced very poor water quality in the form of frequent spring to fall blue green algal blooms, low dissolved oxygen levels and poor water clarity. Watershed runoff rates have increased over time from roadway and agricultural ditches and tiles. Long-term water quality problems have resulted from polluted runoff from manure management, and other agricultural practices from the western watershed of the lake. More recently, sources of polluted runoff have significantly declined since Dane County Department of Land and Water Resources has acquired and managed the surrounding lands. Persistent water quality problems are now linked to internal loading from decades of watershed pollution. Seepage lakes are typically more sensitive to pollution than drainage lakes, and the trapped nutrient loads can manifest themselves in various water quality problems for years to come. Mud lake in the past had a diverse fish fauna with many of the same species found in Fish Lake, until a crash in water quality occurred in the mid-1990's. This led to a documented mass migration of fish through the culverts and into Fish Lake, as well as a die-off of a variety of game, non-game and panfishes. The entire shoreline was surveyed using electro-fishing equipment in the mid-1990's and less than 100 fish were collected. Low dissolved oxygen levels during winter 2008 precipitated a die-off dominated by carp and black crappie.

Fish Lake is a 251 acre seepage lake, and has a hydraulic connection to Mud Lake via culverts, and ground water connection. Fish Lake has a maximum depth of 64 feet, a mean depth of 21.8 feet, and is characterized as mesotrophic-eutrophic (moderately fertile). The lake levels have risen over the past 30 years. The morphometry of Fish Lake is not typical for Wisconsin lakes, due to its depth and ratio of mean depth to maximum depth. Fish Lake is one of the estimated 10% of Wisconsin lakes deeper than 50 feet, yet the mean depth is less than expected, due to a large littoral (shallow light zone) shelf compared to the area of a deep water zone. The ratio of mean depth to maximum depth is a ratio of 0.36 while the statewide ratio of mean depth to maximum is 0.46, indicating lake levels are abnormally high for the shape of the basin the lake occupies (Lillie, Wegner & Quinn, 1997).

The Fish Lake "watershed" ranked high in both the Lower Wisconsin Basin Plan and the Dane County Water Quality Plan for a non-point source priority watershed designation. The lake had some of the best water quality among Dane County lakes as documented during the 1970's to early 1980's. Historically a broad zone of wetland vegetation in Fish Lake's bays, and around the entire Mud Lake shoreline was present, filtering surface water runoff from agricultural fields and residences. The lake was classified as mesotrophic or moderately fertile based on Chlorophyll-a, phosphorus, and secchi disc readings (DCRPC, 1979). Secchi readings since the late 1970's indicated a decline in water clarity. In 1985 Fish Lake was selected for long term trends lakes monitoring. Results of that study indicated that the lake has experienced a gradual decline in water quality. Phosphorus loading during the 1990's was as high as 1,690 pounds/year and fairly high chlorophyll-a have coincided with increased algae blooms. Sediment tests also indicated polluted runoff in mainly the west edge of the lake, but in both shallow and deep water zones. In order to address water quality issues, a cooperative lake management plan was drafted by Dane County and the Department of Natural Resources. Factors contributing to the decline of the lake are believed to be inadequate buffer zones, poor animal waste and feedlot management practices, winter manure spreading, organic loading, sedimentation of the southwest bay, and excessive Eurasian water milfoil growth in the lake. An Environmental Protection Agency (EPA) Clean Lakes research project was conducted on the lake and a lake management plan was completed in 1996. Goals of the management plan include reducing phosphorus from runoff in the watershed by 40%, managing Eurasian water milfoil, and re-establishing native aquatic plants to improve lake balance and stability.

A hydrologic study of Fish, Mud and Crystal Lakes, was funded by a Lakes Planning Grant and conducted by United States Geologic Survey (USGS) and the Dane County Lakes and Watershed Commission. The study objectives were to determine factors that had influenced the long-term trend of rising water levels, and future trends in lake water levels by simulating lake stage, and predicting the effect of pumping water from Fish Lake on future lake stage as a means to reduce high lake stage (Simulation of Fish, Mud, and Crystal Lakes and the Shallow Ground-Water System, Dane County, Wisconsin, USGS, 2002, Water-Resources Investigations Report 02-4014). Recharge used in the model was based on annual baseflow from Black Earth Creek, and a groundwater monitoring well located in the Town of Arena was used as a groundwater reference site. Runoff was based on measured coefficients, precipitation, and evaporation from Fish, Mud and Crystal Lake surfaces. Measured Fish Lake stage was matched to simulated stage to calibrate the transient model. Study results indicated that Fish and Mud Lakes are located in a major ground-water recharge area, and are likely to experience water level fluctuations. Increased lake levels were due to regional ground-water recharge. Simulation results of withdrawing water from Fish Lake at 500 gpm, assumed 1990-1998 climatic conditions, and indicated that after a year of pumping, the stage of Fish and Mud Lakes would be reduced by just more than one-foot, and Crystal Lake reduced by 2.4 inches.

Fish Lake had a diverse fish fauna with 22 species documented in the 1990's. The dominant game fish are slow growing largemouth bass, and northern pike. The panfishery is dominated by a high population density of slow growing bluegill, pumpkinseed, and yellow bullhead. Northern pike numbers and sizes are not what they were historically, due to a combination of over fishing, dense Eurasian water milfoil beds, and a loss of important wetland habitat. Since the late 1990's more protective regulations and stocking have helped trigger a rebound of the species. The lake had a high population of cisco in the 1980's, but has experienced several cisco die-offs. Cisco are a fish that requires cold, deep water and high dissolved oxygen, and die-offs were attributed to low dissolved oxygen levels in the mid - to deep zones of the lake. One state special concern fish species has been found in Fish Lake, and is ranked as rare or uncommon in Wisconsin (21 to 100 occurrences). Other fish present in the lake, and environmentally sensitive to degraded habitat include blackchin shiner, blacknose shiner, smallmouth bass, and Iowa darter.

In 1991, Fish Lake was the subject of an intensive experimental macrophyte manipulation that was initiated by the Department of Natural Resources, due to the extensive mats of dense Eurasian water milfoil, an invasive non-native submersed plant. Dense vegetation had become a nuisance for anglers by the late 1970s, and by the mid-1980s limited recreational access to the fishery. The littoral zone was dominated by a dense stand of Eurasian water milfoil, which formed a contiguous ring around the lake's perimeter at depths ranging from 1.5



m to 4.5 m (Lillie 1996). Eurasian water milfoil comprised 90% of the total plant biomass and covered approximately 40% of the total lake bottom (Budd et al. 1995, Lillie 1996). Twenty-two species of plants were found, and the shallow water near-shore areas contained most of the high quality submergent, emergent and floating native species of plants (Unmuth et. al., 1998).

In 2006 Dane County Office of Lakes and Watersheds contracted with Underwater Habitat Investigations LLC to conduct aquatic plant surveys and prepare aquatic plant management plans for Fish Lake. Findings were consistent with studies in the early 1990's, demonstrating the importance of near-shore areas for sustaining the greatest diversity of native plant species, and that off-shore areas dominated by dense beds of Eurasian water milfoil made it nearly impossible for native plants to flourish. The survey demonstrated effective short-term Eurasian water milfoil management through mechanical harvesting, yet showed a continued decline of high value native plants from a combination of drawdown effects, eradication by lake front landowners, polluted runoff, and soil deposition (Marshall 2007). Recommendations were to conduct a complete inventory of native aquatic plants in the near-shore area to assess their status and condition following pumping and lake drawdown. Sensitive aquatic plant areas, as described by state code were identified as part of the Dane County aquatic plant management planning effort. Those areas include the west shoreline, and Lussier Park shoreline of Fish Lake. To address management plan objectives of restoring degraded shorelines and shallow water habitat for fish and wildlife, American Lotus was planted at the Lussier Park shoreline, however, additional plans for habitat restoration were abandoned due to the proposal by the Fish, Mud and Crystal Lakes District to alter water levels, and the uncertainty of whether plants could survive lower water levels.

Crystal Lake is a 527 acre seepage lake, and is hydraulically connected to Fish Lake by groundwater. Rising water levels have coincided in both lakes for decades (USGS 2002). Maximum water depths were only 6 feet in the 1940s and increased to 9 feet by 1960. During the 1980's, the WDNR conducted animal waste management (NR 243) investigations on several shoreline feedlots along the lake. Major sources of phosphorus are from watershed runoff from feedlots, crop fields, as well as internal loading of phosphorus that mixes throughout the summer, because the lake is shallow. Phosphorus, chlorophyll-a and secchi disk samples indicate the lake is classified as hypereutrophic with dense beds of curly leaved pondweed and high concentrations of filamentous and blue-green alga. Frequent winter fish kills had been documented from the 1940s through the 1960s (DCRPC 1979). Aeration and frequent stocking were necessary to create recreational fishing during that period. In recent years the trend of increasing water levels continued and the maximum water depth has increased to 14 feet. Coinciding with the rising water levels, sustainable largemouth bass and panfish populations in the lake indicate that lack of oxygen related winterkills have declined. The lake is a popular fishery, with good largemouth bass numbers, and plenty of bluegill and pumpkinseed populations with a good size structure. However, periodic columnaris fish kills, largemouth bass virus, increasing carp and yellow bass numbers are current threats to the fishery. Flooded trees along the perimeter of the lake provide important habitat for fish and herptile populations.

#### Mud, Fish and Crystal Lakes Wildlife

Bald eagles, owls, ospreys, a variety of shore birds, turtles, frogs and salamanders use Fish, Mud and Crystal Lakes. Invertebrate Surveys of Fish and Mud Lakes have been conducted recently by the Wisconsin Department of Natural Resources. Seven species of frogs were present, with Spring peeper and American toads most commonly found; less common were chorus, leopard, gray, and green frogs. Bullfrogs, documented in the 1980's to 1990's have not been found in surveys dating back to 2002. Large migrations of eastern tiger salamanders were commonly observed in the 1990's, and a State listed rare species of turtle has been documented along the shoreline.

#### Wisconsin River

The Wisconsin River begins at Lac Vieux Desert, a lake in Vilas County that lies on the border of Wisconsin and the Upper Peninsula in Michigan. The river is approximately 430 miles long and collects water from 12,280 square miles. As a result of glaciation across the state, the river traverses a variety of different geologic and topographic settings. The Mud Lake discharge is proposed to flow into the Lower Wisconsin River,

approximately one-mile below the dam at Prairie du Sac, and on the east bank of the river. The Lower Wisconsin in this segment is free flowing for 92 miles from the Alliant Energy Dam at Prairie du Sac to its confluence with the Mississippi River. The operating permit for the dam is regulated by the Federal Energy Regulatory Commission (FERC). The Lower reach is among the least disturbed parts of the Wisconsin River and is one of the highest quality large warm water river reaches remaining in the United States. The river corridor is relatively free of development along the banks or on the overlooking bluffs. In recognition of this great resource, the Wisconsin Legislature created the Lower Wisconsin State Riverway (LWSR) in 1989, which includes the 92.3-mile free-flowing stretch of the river from the Prairie du Sac dam down to the river's confluence with the Mississippi River. The riverway project covers 79,275 acres, of which the state owns more than 43,740 acres with easements on more than 2,800 acres. These publicly owned lands provide opportunities for hunting, wildlife viewing, hiking, biking, horseback riding, skiing, and snowmobiling. In addition to providing diverse recreational opportunities, these lands help to preserve large blocks of upland and lowland habitat for wildlife. The Lower Wisconsin River's historical significance, good quality aquatic and wildlife resources, beautiful scenery and abundant recreational opportunities make the river a special resource.

The Lower Wisconsin River, is classified as a diverse warm water sport fishery (WWSF) and an Exceptional Resource Water (ERW). The ERW status reflects a large river system in the driftless area that has unique natural, biological, historical and cultural resources. Anglers enjoy the opportunity to catch a variety of different sport fish on the river. Water quality was not always favorable in the river. Prior to the Clean Water Act of 1970, The river supported commercial fishing until frequent fish kills and unpalatable fish were found to be linked to pollutants in the water and suffocating filamentous bacteria. This destroyed both commercial and sportfishing opportunities. However, since the enactment of the Clean Water Act, there have been many improvements in water quality from treatment of industrial and wastewater facilities. The Lake Wisconsin impoundment acts as a sink, trapping many pollutants from the river above the lake as well as from a large watershed. Water quality of Mud Lake discharge water, and Wisconsin River upstream of the discharge point was collected by Mead & Hunt, Inc., consultants for the Fish, Mud and Crystal Lakes District, from April through December 2008 (Appendix). Levels of ammonia, BOD<sub>5</sub>, pH, and total suspended solids were higher in samples of Mud Lake discharge water compared to Wisconsin River water. Water quality of the discharge did not meet background limits for effluent into the Wisconsin River as required by NR 102 for ERW waters. Limits for the discharge were calculated on the Fish and Aquatic Life standards instead of the Exceptional Resource water standard—based the criteria in NR 207 that addresses health, social and economic issues.

The Lower Wisconsin River sustains 98 native fish species that find their home in the Lower Wisconsin main channel, floodplain lakes and sloughs. The high diversity of fishes found in the Lower Wisconsin reflects the natural riverine and off-channel lake and slough habitats. The river is also home to eight species that represent primitive or ancient "living fossil" fish forms, such as paddlefish, lake sturgeon, gars, bowfin, and native lampreys. Several are specific hosts for the mussel larvae (glochidial) stage of a number of rare, threatened and endangered freshwater mussels found in the Wisconsin River. The river also supports a rich diversity of mussels, herptiles, amphibians, and aquatic insects. There are threatened and endangered amphibians and reptiles. Rare dragonflies, as well as eight species of mayflies (Ephemeroptera) and four species of beetles (Coleoptera) are found almost exclusively in the river. Six species of threatened, endangered or special concern fish, and eight state listed endangered, rare, threatened, or special concern mussels are located within a one-mile buffer of the discharge point of the Wisconsin river according to a search of the Natural Heritage Inventory. Of the federally listed species, there are two threatened bird species, one endangered mussel, and two threatened plant species found in Dane County. The Wisconsin River has numerous game and non-game species of wildlife such as eagles, osprey, sandhill cranes, deer, raccoon, muskrat, beaver, opossum, ducks, and geese.

#### Sloughs and Side Channels

The Wisconsin River flows through the southern part of the Driftless Area where there are few natural lakes and wetlands compared to other areas of the state. One of the unique features of the Wisconsin River Valley is the natural geomorphologic cycles linked to the Glacial Lake Wisconsin that have created over 12,000 acres of wetlands, oxbows, side channels, floodplain lakes and sloughs. These habitats function as an important

transition zone between riparian and riverine habitats and are critical for reproducing gamefish, panfish, forage fish, and supporting a variety of plants and rare fish, some significantly different from those found in the main channel. Adjacent to the discharge point, is a discharge point from a backwater channel that carries flood waters to the Wisconsin River, and a backwater slough that is fed by groundwater seepage. Temperatures taken in the backwater slough during the emergency pumping directly to the Wisconsin River on October 24, 2008, indicated it is groundwater fed, and much clearer and colder compared to both the Mud/Fish discharge and Wisconsin River water, on the same date.

### 13. Cultural Environment

#### a. Land use (dominant features and uses including zoning if applicable)

The pump intake is located in Mud Lake, specifically the southeast corner of Mud Lake and is piped underground through a pipe along the right away of an existing roadway to where it currently discharges over land ultimately flowing into the Lower Wisconsin River. The land use is predominantly agricultural and rural residential in the area crossed by the pipeline. The area where it currently discharges is considered to be recreational land owned by the State of Wisconsin. The Lakes of Fish, Mud and Crystal are used as recreation, offering great fishing and wildlife viewing opportunities. The Town of Roxbury is zoned.

#### b. Social/Economic (including ethnic and cultural groups)

Agriculture, forestry, tourism, recreation, government, and light industry are major economic interests in Dane County. Agriculture, recreation and tourism are very important as well to the community of Roxbury.

Controversy over the possible impacts and benefits from the pumping project has been very disruptive to the local community. People have been displaced by the high water because of flooding and high water. The decision making process regarding this project has also been very costly in terms to time and expense that individuals and organizations have devoted to preparing plans

#### c. Archaeological/Historical

The State Historical Society Protection Office (SHPO) has approved the site as not having historical significance. A search for Archaeological sites was conducted and no known sites were shown to be impacted by the project.

### 14. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

The Lower Wisconsin River is classified as an Exceptional Resource Water under Wisconsin Administrative Code NR 102. This is the second highest level of protection given to surface waters under state law. There are State and Federally listed mussels located in the Lower Wisconsin River near the discharge area. These species are located upstream of the discharge point and are not considered to be impacted. The State of Wisconsin owns property along the Lower Wisconsin River. This property is managed for wildlife and is used as a recreational area.

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### ENVIRONMENTAL CONSEQUENCES (probable adverse and beneficial impacts including indirect and secondary impacts)

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#### 15. Physical (include visual if applicable)

## Beneficial Physical

### Mud, Fish and Crystal Lakes

A decline in water level could positively affect infrastructure, roadways, and homes, if pumping is effective in lowering water level. Township road crews have had to raise and repair flooded roads bordering the lakes several times to provide transportation to residents, school buses, emergency and commercial vehicles. According to the Mead and Hunt feasibility study the total costs of flood related impacts was estimated to be over \$1,000,000. The cost of road maintenance was nearly \$400,000 over the past 8 years, and is time consuming for local road crews. Lowering lake levels should eliminate the need for, and costs of road maintenance. Some residences have had to abandon their homes or lost living and yard space, resulting in a loss in property value. Flooded residences have had to incur the costs of building dikes, sandbagging, maintaining driveways, and pumping water from their homes. There is also the cost of construction repairs and cleanup during periods when water levels receded. The costs of protecting homes from floods and subsequent construction repair and cleanup should be eliminated, and property values should increase if lake levels are significantly lowered. High water levels have resulted in flooding septic systems, and garages, adding nutrients and pollutants to the lakes.

The health concerns pertaining to the flooded residences as noted by the Wisconsin Department of Health Services would likely be alleviated if the water level of Fish Lake were lowered. These issues include the problems with drinking water, wastewater disposal concerns, increased problems with insects, electrical safety issues, and problems with mold/bacteria growth.

A reduction in lake levels should help alleviate the addition of pollutants to the lake. Lake shorelines have eroded on all lakes from rising water levels. Occasional high winds on all lakes and motorized boat traffic on Crystal Lake exacerbates shoreline erosion. Much of the shoreline along roadways and residences have had applications of rock riprap to stabilize the shore.

Boat access has been extremely difficult at Fish and Crystal Lakes, with much of the area of the landings submerged. Vehicle and boat trailer parking areas were already extremely limited at the Crystal Lake public landing, given the amount of watercraft use on the lake. The parking area has nearly been eliminated by flood waters, and the portable toilet frequently inundated. The access road and landing have incurred damage requiring maintenance by the DNR and the township. Lowering the water levels should make landings and parking more accessible. Shore angling of all lakes, but especially along Fish Lake Road, has been reduced due to high water. Lowering water levels could benefit access for shore anglers.

### Wisconsin River, Sloughs and Side Channels

Construction of a pipe directly from Mud Lake to the Wisconsin River should eliminate erosion that was evident when emergency pumping was day-lighted into an open ditch system. The open ditch system eventually eroded due to sandy soils, and allowed Mud Lake water to flow overland into a Wisconsin River side channel that is normally inundated only during floods, as well as to an isolated slough having good water quality. The pipe would eliminate mixing lake water with more high quality slough water, and maintain the capacity of the side channel for the Wisconsin River in the event of flooding. In addition, erosion of sandy soils in this area as a result of overland flow should be eliminated.

## Adverse Physical

### Wisconsin River, Sloughs and Side Channels

Scenic natural beauty is important to river users, and the outlet represents a negative impact to some. Visual impacts of the "dirty" discharge water was documented during emergency pumping, during the summer months when total suspended solids (silt, organic matter, pollutants) were at their highest in the discharge outlet to the Wisconsin River. A pipe extending to deeper water was considered during the planning phase, but visual impacts of the pipe, and navigational interference were of major concern. The shoreline at the discharge point is alluvial sands, and highly erosive, forming a scour hole formed at the river bank during

emergency pumping. To alleviate erosion, while maintaining a natural shoreline, an engineered spreader at the outlet was recommended as a means to dissipate water on the bank above the river at a point screened by sandbar willows. If erosion occurs below the level spreader, stabilization in the form of rip rap will likely be necessary, and then would be visible to recreationists. Although these sloughs receive significant recharge from groundwater, the effects of pumping Fish/Mud Lake on this groundwater recharge will diminish as you move away from the pumping site. It is not anticipated that there will be any measurable impact from the pumping of Fish Lake on these sloughs.

#### 16. Biological (including impacts to threatened/endangered resources)

##### Beneficial Biological

###### Fish, Mud and Crystal Lakes

Lowering water levels will expose lake bed, and if maintained in a natural vegetative state, could provide a benefit to lakefront owners, reducing runoff from residences, and providing screening from lake users. Shoreline erosion has increased around the lakes, especially in areas of roadways and residential lawns. This erosion results in accelerated rates of sediment flowing into the lakes. Reduced sediment may benefit aquatic insects and shallow water spawning fishes. In addition, if lakes were significantly lowered and rock riprap no longer necessary, a more natural shoreline would benefit wildlife that use shorelands.

It is also possible that wetlands, cattail beds and marshes once present at the perimeter of some areas along Fish, Mud, and Crystal Lakes would also be re-established if landowners refrain from herbiciding or removal of the vegetation. This could result in an increase in wetland habitat, and benefit populations of northern pike, shoreland wildlife, and a state threatened turtle that prefers open marshy habitat, and lays its eggs on sandy flats. Lowering water levels of all the lakes may increase the habitat for shoreland birds that use mud and sand flats, until vegetation succession occurs on the flats.

##### Adverse Biological

###### Fish, Mud and Crystal Lakes

There is a possibility of fish entrainment of larval sportfish or rare fishes at the inlet pipe in Mud Lake. However, during the emergency pumping it was obvious that some larval fish had move through the pipe as bluegill less than 1" inch in size were observed in the pumped water at the outlet, well away from the bank of the Wisconsin River.

Combined effects of natural groundwater declines and pumping could mean that there will be a lesser volume of water in the hypolimnion (dense, bottom layer of water in a thermally-stratified lake) of Fish Lake. However, pumping will have a limited impact on the hypolimnion because the water level in Fish Lake can only be lowered by pumping to the Ordinary High Water Mark. A larger volume of water in the hypolimnion would favor the unique inland cisco population that inhabits this lake. Reduced hypolimnetic volume during the summertime can create a significant dissolved oxygen deficit within the cool temperature depth range that cisco inhabit. Cisco kills have periodically occurred in the past due to low oxygen levels in the hypolimnion.

Higher water levels in all three lakes means there is more available "living space" for biota in the lakes. Lowering water levels in all three lakes will reduce spawning and rearing habitat for shallow water spawning fishes if these shallow areas are lost because of lowered water levels.

The littoral zone (zone of light) can be adversely affected, and the impacts were actually documented in 2006 and 2007 during the period of relatively lower water levels. However, during those years a small amount of pumping did occur. Significant damage was reported to sensitive plant areas in Fish Lake in 2006 and 2007. The sensitive areas, supporting high value native aquatic plants, were damaged both years when water receded and floating leaf habitat declined. Sensitive plant areas are protected under NR 107.05 (3)(i) and NR 109 (3)(f) and Chapter 30 permit applications are typically scrutinized when lake drawdowns are used for

aquatic plant management that could undermine sensitive areas. Eurasian water milfoil will take over these areas where the sensitive aquatic plant species have declined or disappeared. These areas are important spawning habitats, and critical life history stages for fish, including a State Special Concern fish species found in Fish Lake.

Higher water levels have provided environmental benefits to Crystal Lake by eliminating annual winterkill. A return to historic winterkill conditions on Crystal Lake could negatively impact an economically valuable and popular sport fishery; however, this scenario is not likely given limited impact of pumping on Crystal Lake. Increased groundwater inputs provide a source of low nutrient water that benefits lake water quality. In spite of continued hypereutrophic conditions in Crystal Lake, greater water volume has apparently increased the total lake oxygen mass.

Lowering the water levels in all lakes may reduce the amount of flooded woody debris available for fish and herptile habitat. However, it is likely that previously submerged woody debris at lower depths will be present in the “new” littoral zone as the water level is lowered.

The water levels are expected to be lowered gradually; hence, herptiles should be able to adjust to these changes in the fall as they select their overwinter habitat (Hay, 2008). However, if lake levels drop too quickly or below hibernation sites, this can have negative effects on amphibians, particularly during winter hibernation. This is not expected to occur and the pumping will be limited so that the water level cannot drop below the Ordinary High Water Mark. Green Frogs and bullfrogs, species found along Fish and Mud Lakes, in particular are dependent on permanent water in shallow bays. Pumping may reduce shallow water areas necessary for frog breeding initially, but these breeding areas will reappear as littoral zone habitat reappears in response to lowered water levels.

#### Wisconsin River, Sloughs and Side Channels

Transfer of lake fish from Mud and Fish Lakes into the Wisconsin River may have negative impacts to riverine fishes. There are several fish species, including a State Special Concern fish found in Fish Lake that has not been found in the Wisconsin River. While some of the fish from Mud and Fish Lakes may not survive in a riverine habitat, they could potentially survive in backwater floodplain lakes or sloughs. These fish could compete with others that use similar habitats, spawning nesting or feeding areas, if populations thrived in the river. Additionally, the Wisconsin River may have genetically distinct populations of fish, which could be negatively impacted when new genetics are introduced. Fish transfers can have long-term negative effects on growth, survival, reproduction and health of existing fish populations and newcomers. Genetic differences among walleye, largemouth bass and northern pike stocks have been documented even within the same drainage or watershed.

The stretch of river below the Alliant Energy Dam at Prairie du Sac experiences periodic low dissolved oxygen levels which are largely uncontrollable (periodic low dissolved oxygen levels were documented as part of FERC relicensing). Several aquatic species (some rare and threatened) occur in this reach of the river and are periodically exposed to these low dissolved oxygen stresses that are linked to organic loading and release from Lake Wisconsin. The discharge from the pumping will have effluent limits (Fish and Aquatic Life Limits), that represent approximately 1% of the assimilative capacity of the Wisconsin River at low flow conditions. Still there will be some additional organic loading and the biota of this reach of the river will be exposed to this additional loading—although the amount is extremely small.

In the event that Fish and Mud Lake are subject to introduction of an additional invasive species, then the transfer of that invasive species to the Wisconsin River is possible. This applies to several invasive species including inter-drainage transfer of pathogens and/or cyanotoxins.

Eurasian water milfoil grows abundantly in Fish Lake and, therefore, can be transferred through pumping into the Wisconsin River at the discharge point. It is not expected that this will greatly impact the Lower Wisconsin River, because Eurasian water milfoil is already present in the Lower Wisconsin River and Lake Wisconsin

immediately upstream, which is infested with Eurasian water milfoil, is an even greater contributor of this exotic to the Lower Wisconsin River.

## 17. Cultural

### a. Land Use (including indirect and secondary impacts)

The land use would change at the outlet location near the Lower Wisconsin River. This area is presently an undisturbed, floodplain forest setting. If the outlet is constructed, the wooded area would be disturbed with the construction of the pipe and outfall structure. This would be a localized, long-term effect confined to the outlet site.

### b. Social/Economic (including ethnic and cultural groups, and zoning if applicable)

During construction, minimal disruption to recreational users will occur at the outfall area since most of the pipeline has been installed. Long-term, the Fish, Mud, Crystal Lake Association will be able to discharge into the Wisconsin River to control water levels at Fish, Mud and Crystal Lakes. This should help alleviate present concerns over property damage, loss of tax base, suppressed tourism, recreation, etc.

The existence of the diversion system, if successful (which has been discussed elsewhere in this document) could create a false assumption that the lake level could be controlled and foster development that still could be vulnerable to high water levels. In the long-term, it would be very important to protect the lake through strong zoning efforts including: the enforcement of setbacks for structures, restoration of natural shoreland buffers and enforcement to prevent future building in flood prone areas.

Winter recreation on these lakes could be affected if water is drawn off from below the established ice line. The intake area would need to be barricaded for public safety.

### c. Archaeological/Historical

There are no existing Archaeological or Historical issues involving the construction or implementation of this project.

## 18. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

We are not aware of any special resources that have not been addressed.

## 19. Summary of Adverse Impacts That Cannot Be Avoided (more fully discussed in 15 through 18)

As mentioned above, surrounding land use would change at the outlet location near the Lower Wisconsin River. This area is presently a relatively undisturbed, floodplain forest setting. If the outlet is constructed, the wooded area would be disturbed with the construction of the pipe and outfall structure. This would be a localized, long-term effect confined to the outlet site.

The effectiveness of the pumping is difficult to assess because the precipitation patterns are unknown and could possibly result in additional groundwater recharge. This could render the pumping project to alleviate flooding as being unsuccessful, and there would be a large public and private investment in the project that would be wasted. The existence of the diversion system could create an unrealistic assumption that the lake level could be controlled and foster development that still could be vulnerable to high water levels. Winter

recreation on these lakes could be affected if water is drawn off from below the established ice line. The intake area would need to be clearly marked for public safety since the ice may be very thin at that location.

Periodic low dissolved oxygen levels in the Lower Wisconsin River were documented as part of a FERC re-license and are largely uncontrollable. The discharge from the pumping will have assimilative capacity limits (Fish and Aquatic Life Limits), that represents less than 1% of the flow from the Wisconsin River at low-flow conditions. Still there will be some additional organic loading and the biota of this reach of the river will be exposed to this additional loading—although the amount is extremely small. In the event that Fish and Mud Lake are subject to introduction of an additional invasive species, then the transfer of that invasive species to the Wisconsin River is possible. This applies to a wide range of invasive species including inter-basin transfer of pathogens and/or cyanotoxins. There is a possibility of fish entrainment of larval sportfish or rare fishes at the inlet pipe in Mud Lake. Combined effects of natural groundwater declines and pumping could mean that there will be a lesser volume of water in the hypolimnion of Fish Lake, which may impact the cisco population that inhabits this part of the lake. Higher water levels in all three lakes means there is more available “living space” for biota in the lakes. Lowering water levels in all three lakes will reduce spawning and rearing habitat for shallow water spawning fishes. Pumping may reduce shallow water areas necessary for frog breeding initially, but these breeding areas will reappear as littoral zone habitat reappears in response to lowered water levels.

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#### DNR EVALUATION OF PROJECT SIGNIFICANCE (complete each item)

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20. Environmental Effects and Their Significance – This section describes risks that people opposed to this project have voiced. These concerns have merit, however, under the Department’s permitting process, it has been determined the permit can be issued. The Department has an obligation to follow the law, which in this case allows permit issuance.

- a. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are long-term or short-term.

##### Short-Term

The water quality impact of the discharge to the River will likely be minor and short term given that: 1) sample data indicates the lake discharge water quality in 2008 was often comparable to or better than the River’s water quality, 2) the discharge volume is an insignificant fraction (0.0009) of the River’s flow during River low-flow conditions, 3) the Department’s technical review of River and discharge data concluded that water quality based effluent limits were not necessary in the proposed WPDES permit – only limits based on best professional judgment in order to provide some reasonable measure of control.

Along with an increase in pumping from 500 gpm to 900 gpm, the water will be conveyed to the river in a buried pipe. The ground will be disturbed briefly until vegetation can be re-established at the site. The soil disturbing activity will be regulated in accordance with NR 216, a Lower Wisconsin Riverway Permit, and a Dane County Permit for Disturbing Soil in the Floodplain.

##### Long-Term

There is a possibility that invasive species could be transferred from Fish Lake to the Wisconsin River. There is Eurasian watermillfoil in Fish Lake at the present time, and relatively little in the reach of the Wisconsin River where this discharge will take place. However, Eurasian water milfoil is already in Lake Wisconsin and some floodplain lakes of the Lower Wisconsin River.



In 2007, VHS (Viral Hemorrhagic Septicemia ) occurred in Wisconsin for the first time. The first documentation of the disease occurred in Lake Winnebago and waters of Lake Michigan. Since 2007, the Wisconsin Department of Natural Resources has conducted extensive testing for the disease to determine its range. To date, VHS has only been detected in fish from the Lake Winnebago system, Lake Michigan and Green Bay. Because of the Department's extensive testing, the risk of VHS being transmitted to the Wisconsin River from Mud Lake is determined to be extremely low. Viral testing in Fish (2008) and Crystal (2006) Lakes did not detect VHS or other viral pathogens. Samples of fish tested from the Wisconsin River and from Crystal Lake have been tested for VHS and were found to be negative.

The water level of Fish Lake (and Mud Lake) can be lowered to the ordinary high water mark through pumping depending on future precipitation patterns. The littoral zone will change with lake elevations and reestablishes itself accordingly.

The discharge point of the outfall is not expected to be visible to users of the Wisconsin River. However, it is possible that it would be visible and this outlet could be viewed by some users as unsightly and impacting their recreational experience — especially if the outfall is armored to address an erosion problems.

- b. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are effects on geographically scarce resources (e.g. historic or cultural resources, scenic and recreational resources, prime agricultural lands, threatened or endangered resources or ecologically sensitive areas).

The discharge point is not expected to have adverse impacts to the areas mentioned in this question. Scenic issues were addressed under Paragraph 20a.

- c. Discuss the extent to which the primary and secondary environmental effects listed in the environmental consequences section are reversible.

Once the discharge pipe is installed, it will likely not be removed. However, the pumping equipment and pipe could be removed, and the site could also be restored where the pipe was located. A more natural, but higher water level regime could resume, which could mean the flooding issues for lakeshore property owners could return under current weather patterns.

## 21. Significance of Cumulative Effects

- a. Beneficial Cumulative Effects of Pumping: reduced health risks, reduced flood damage costs

The best available information the Department has regarding pumping effectiveness (USGS study and 2008 pumping results) suggests that prolonged pumping is associated with reductions in lake levels (regional precipitation regional groundwater trends and evaporation are significant factors). Prolonged pumping may enable lake residents to continue living in their homes without facing increased health risks and expenses due to flood damage to private and public property.

- b. Adverse Cumulative Effects of Pumping: degradation of Wisconsin River water quality, introduction of invasive species, and damage to Fish Lake Sensitive Areas

As has been stated previously, adverse impacts to the River from the Lake discharge are not likely to be significant given that: 1) the discharge flow is 0.0009 of the River flow during low flow conditions, 2) 2008 sample results indicate the Lake water quality was often comparable to or better than the River's water quality and 3) DNR's effluent limit recommendations for the proposed WPDES permit indicate the River's assimilative capacity for the pollutant, biochemical oxygen demand (BOD), is 90 times greater

than the proposed BOD effluent limit.

Less is known about the cumulative adverse effects to the River from the introduction of invasive species via prolonged pumping. However, given the extent of the Wisconsin River watershed upstream of the discharge site, the significance of adverse effects to the Lower Wisconsin River from introduction of new species from these two Lakes would seem far less than the threat of such introduction from the upper two-thirds of the Wisconsin River watershed.

Lastly, DNR has reports indicating that damage occurred to valuable aquatic plants in Sensitive Areas on Fish Lake in 2006 and 2007 due to decreasing lake levels. It is unknown however, what the long-term effects of pumping might be on this plant community and if they will become reestablished in the new littoral zone.

## 22. Significance of Risk

- a. Explain the significance of any unknowns that create substantial uncertainty in predicting effects on the quality of the environment. What additional studies or analysis would eliminate or reduce these unknowns?

There is a possibility that invasive species could be transferred between the water bodies. This is especially so for transfer of invasive species from Fish Lake to the Wisconsin River. For example, there is Eurasian watermillfoil in Fish Lake and relatively little in the reach of the Wisconsin River where this discharge will take place. However, Eurasian water milfoil is in Lake Wisconsin and in some floodplain lakes of the Wisconsin River, so this is actually already in the Lower Wisconsin River. Of even greater significance is the possibility of invasive species being transferred to the Lower Wisconsin River from the great number of tributaries in the Wisconsin River system upstream.

In 2007, VHS (Viral Hemorrhagic Septicemia ) occurred in Wisconsin for the first time. The first documentation of the disease occurred in Lake Winnebago and waters of Lake Michigan. Since 2007, the Wisconsin Department of natural Resources has conducted extensive testing for the disease to determine its range. To date, VHS has only been detected in fish from the Lake Winnebago system, Lake Michigan and Green Bay. Because of the Department's extensive testing, the risk of VHS being transmitted to the Wisconsin River from Mud Lake is determined to be extremely low. Samples of fish tested from the Wisconsin River and from Crystal Lake have been tested for VHS and were found to be negative. Viral testing in Fish (2008) and Crystal (2006) Lakes did not detect VHS or other viral pathogens.

- b. Explain the environmental significance of reasonably anticipated operating problems such as malfunctions, spills, fires or other hazards (particularly those relating to health or safety). Consider reasonable detection and emergency response, and discuss the potential for these hazards.

The technology utilized in the proposed discharge is very simple and common. Municipalities all over the world use pumps to transfer water through underground pipes to another location. Pipes do rupture on rare occasions and this could occur to the Fish Lake discharge pipeline to the River. Such a rupture could result in localized soil erosion. The pipeline follows town or state roadways over most of its route so detection by passersby would likely occur and the pump could be shut off until repairs were made. A condition will be added to the draft permit requiring the Lake District to suspend pumping until such a malfunction is corrected.

As has been discussed elsewhere in this document, there is a risk that precipitation patterns could continue at high levels and the pumping would not adequately lower the water levels in the lakes so that the high water problems are addressed. This would result in a significant loss in terms of funding and time that have been invested in this project.

## 23. Significance of Precedent

Would a decision on this proposal influence future decisions or foreclose options that may additionally affect the quality of the environment? Describe any conflicts the proposal has with plans or policy of local, state or federal agencies. Explain the significance of each.

The Lower Wisconsin Riverway Board opposes the issuance of this permit because they feel it would degrade the water quality of the Wisconsin River. This discharge is well within the calculated discharge limits for this reach of the Wisconsin River. Using (FAL) standards, DNR could allow a BOD limit as high as 1,812 ppm without regulating the discharge as a "significant lowering of water quality" according to NR 207. DNR recommends Best Professional Judgment discharge limits for BOD and suspended solids of 20 and 40 ppm, respectively, plus pH limits of 6 - 9 and monitoring for ammonia and phosphorus.

There has been a concern over establishing a precedent regarding allowing a WPDES discharge to an Exceptional Resource Water (ERW) to be regulated by standards for Fish and Aquatic Life (FAL) Waters rather than the more stringent ERW standards. The Department does not view this proposal as precedent setting because it is already established in Wisconsin Administrative Code, Ch. NR 207. This code requires the Department to establish effluent limits using FAL standards for discharges that provide economic benefit to a community or correct a public health problem. The Department has 2 letters (see attachments) from the Dane County Dept. of Human Services that identify the health risk to lake residents posed by failing septic systems. The Department also has information from lake owners and the Town of Roxbury regarding the cost to them of protecting private property from flooding or repairing road damage caused by flooding. If similar proposals arose elsewhere in the Lower Wisconsin Basin, the Department would review them using existing regulations and issue the appropriate permits/approvals, or denials, just as it has with this proposal.

Diversion of water from Mud and Fish Lakes to the Wisconsin River does not remove any water from the Wisconsin River watershed or from the larger Wisconsin River drainage basin. A portion of the present groundwater flow from Mud and Fish Lakes to the Wisconsin River would occur (on an accelerated basis) through the pipeline. This does not set a precedent of moving water to another watershed/basin (or another state) which has been of concern in other diversion proposals.

## 24. Significance of Controversy Over Environmental Effects

Discuss the effects on the quality of the environment, including socio-economic effects, that are (or are likely to be) highly controversial, and summarize the controversy.

### Impacts of Flooding on Residences and Infrastructure

The high water of Fish, Mud and Crystal Lakes has been rising for many years (USGS, 2002) and has caused real impacts to property, posed health risks to residents due to flooded septic systems and private wells, and created economic costs to local government and private businesses. Residents have been displaced from their homes (permanent and seasonal). They have incurred costs to their property (property damage), have to deal with mold in the house, damage to infrastructure (roads), and costs in terms of installing and maintaining the pumping system. The Department based their justification for using the health standard used on information received from the Dane County Health Department and the Wisconsin Division of Health and Human Services (this information is included in the appendix). The Wisconsin Department of Health Services has noted several health related issues that alerted the Department to the public health problem in the District. This qualified the District for increased effluent limits using FAL standards rather than the more restrictive ERW standards. These issues include the problems with drinking water, wastewater disposal concerns, increased problems with insects, electrical safety issues, and problems with mold/bacteria growth.

#### Impact to the Wisconsin River From the Discharge

The increased discharge to the Wisconsin River from the pump installed at Mud Lake will have limits that use less than 1% of the available assimilative capacity of the Wisconsin River in that reach. The discharge will have adequate mixing and assimilation and will not significantly adversely impact water quality.

#### The Department is Setting A Precedent by Applying the Health, Economic and Social Impact Criteria to Justify Using Assimilative Capacity

There is no precedent being set because that procedure is clearly already set forth in the code (NR 207). Health impacts have been described under Section 15 (see also appendix). There are documented expenditures of local funds by the Town of Roxbury and the Town of West Point, which are approximately \$150,000 in roadway repairs to deal with the impacts to the road between Fish and Mud Lake. According to the Mead and Hunt feasibility study, total costs of flood related impacts was estimated to be over \$1,000,000. Public Health and economic impacts are specified criteria in NR 207 that would allow a discharge limit to be based on FAL criteria and not the exceptional resource water (ERW) criteria which states that the discharge cannot go above background levels in the ERW receiving water.

#### The Discharge to the Wisconsin River Will Adversely Impact Water Quality

The discharge represents approximately 0.1% of the low flow condition of the Wisconsin River. It is not anticipated this will adversely impact the flora and fauna of the Wisconsin River, because of the relatively small amount of the discharge to the total volume of the Wisconsin River in this reach.

#### Lowering the Water Level in Fish Lake Will Harm Biota

Lowering the water level in Fish Lake will be done in a very gradual manner. This will allow biota (including herptiles) time to adjust and react to these changes in water level. The water level cannot go below the Ordinary High Water Mark.

#### Effectiveness of this Pumping Project

In 2002, USGS also issued their study of the situation, which stated that pumping 500 gpm of Fish and Mud Lakes for one year would reduce water levels just over one-foot—Crystal Lake would be reduced less than 0.2 feet (USGS, 2002). Four months of pumping during the summer and fall of 2008 resulted in Fish Lake being reduced in lake level by 1.18 feet and Crystal Lake 0.44 feet despite record rainfall during June 2008. (Some of this decline is likely the direct result of evaporation and the declining regional water table.

The lake level declines that occurred during the pumping from Mud Lake in 2006 and 2007 also coincided with area trends of decreasing groundwater levels (or increased vertical distance to water table below the land surface), based on well monitoring data (USGS). Lake level declines during those years were most likely due to the decreasing groundwater trends because very little pumping occurred then. Since these declines may not be attributed to pumping alone, and an updated model may be helpful to better assess lake pumping effectiveness. Information on pumping volume and lake level volume change can be useful, but that information alone may not reflect area groundwater trends.

The potential for reducing lake levels in Crystal Lake by pumping Mud Lake is less well understood, since these could be separate sub-watersheds and lake basins. The question regarding the link between Mud Lake pumping and Crystal Lake water levels has been raised in the past. . (Currently, Crystal Lake is being pumped to Roxbury Creek under the requirements of a temporary discharge permit from the Department.) The recent unexpected rise in Crystal Lake water levels is evidence for Fish Lake and Crystal Lake being in two separate sub-basins.

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25. Briefly describe the impacts of no action and of alternatives that would decrease or eliminate adverse environmental effects. (Refer to any appropriate alternatives from the applicant or anyone else.)

#### No Action

If no action is taken, the homes on Fish Lake will continue to be impacted by rising waters if current weather patterns continue. Property and infrastructure damages will likely continue and homes will continue to deteriorate. Some homes would continue to be inhabitable, however. Infrastructure such as roads would likely continue to be damaged. Eventually homes would need to be relocated or demolished if the water gets high enough—however the amount that the water level will continue to rise is unknown. Lakeshore property owners would continue to face loss of dry shoreland, as well as threats to structures and property during high water cycles. This has a detrimental spin-off effect on property values, salability, tax base, tourism, and recreation. The loss of this tax base and economic impact would be significant to the Townships of Roxbury and West Point. The waters may eventually recede, however, and the homes may or may not be inhabited depending on the condition of the homes.

#### Purchase Property from Landowners Impacted in Flooded Areas

This option involves acquiring property from residences that are impacted by flooding and has been proposed by Dane County as an available option for the residences that are living along Fish Lake. Dane County arranged for a “buyout” of these residences in 2002 for the properties affected along Fish Lake. Moreover, Dane County also offered to work with residences to provide nearby properties that the landowners could possibly relocate to and remain in the area. No landowners accepted the offer of buyout assistance. Since the Fish Lake residences are within the Dane County’s Lussier Park project boundary, they are eligible for county acquisition of their property at fair market value. This value will be based on the condition of the property and assumes there are no damages from the flooding.

To date, no landowners have chosen to accept this voluntary option. If the landowners were to select this option, it could be a cost effective and a practical way to deal with the situation. However, it is voluntary on the part of each individual landowner. It is unknown if the water levels of Crystal and Fish Lakes will keep rising, and if the pumping system will have the capacity to effectively discharge the water from the lakes. Purchasing the property of residences and relocating people would not address the impact of the high water on town roads and other infrastructure.

Owners of commercial property are not eligible for a “buyout” based on flood hazard. This would apply to the two campgrounds, which are located on Crystal Lake. Impacts from an economic standpoint for these campgrounds could be significant if high flood waters prevent use of these campgrounds. For mobile homes, their losses could be offset if these mobile homes could then relocate to other locations (higher ground) in the campground.

Although the project meets the legal requirements of the permits involved, the Department recognizes that the only alternative that guarantees that health risks and flood damage would be eliminated for lake residents is the residence purchase option.

#### Diverting water to Dry Acreage and/or Quarry

An initial drawdown to agricultural fields was considered, however, pumping to these areas would likely raise water levels in the ground because of already raised groundwater levels. This alternative would require sufficient acreage to absorb a large volume of water without overflowing to surface water or raising the groundwater table to a nuisance level. There is also a quarry nearby (due west on Highway 188) that has been suggested as a possible site to pump the water. This may involve a land purchase by the Lake District and a change in the pipe routing.

#### Installing a High Capacity Well to Draw Down the Level of Mud and Fish Lake

If a high capacity well were installed to lower the groundwater level in the vicinity of Mud and Fish Lake, it

could possibly lower the lake level. It is unknown to what extent this would be successful without an extensive groundwater/surface water study. This could result in a discharge of higher water quality to the Wisconsin River.

#### Pump to Infiltration Cells

This option involves pumping water to infiltration cells instead of discharging the pumped water from Mud Lake to the Wisconsin River. This option was attempted twice and was not successful. In both attempts (2004 and 2008), the discharge of the pumped water overwhelmed the infiltration system with the volume of the water and associated solids. Since the infiltration cells were located on the Lower Wisconsin State Riverway Property, the Lake District would be required to secure property from the Lower Wisconsin State Riverway in trade for the use of the infiltration cells. The Lake District would then own these cells.

#### Pump from Fish Lake - Shallow Withdrawal

Withdrawal of water from the southwest bay of Fish Lake was proposed during 2003. This option was not pursued because it would then allow water from Mud Lake to flow into Fish Lake through the culverts located in the embankment at Fish Lake Road. The differential in lake level caused by lowering of Fish Lake would allow Mud Lake water which was of lower water quality to degrade Fish Lake water quality. Please see the appendix for a more complete explanation of why this option was not pursued. These concerns were also expressed by researchers from the University of Wisconsin, Madison, Center for Limnology and Department of Natural Resources Integrated Sciences Services. Maintenance of the system can be an additional problem since the southwest bay contains abundant aquatic macrophytes. Intake plugging would be an unavoidable maintenance issue at this location. It is considered that any proposed pumping that further threatens an already threatened seepage lake would undermine the public trust and protection of this important resource. Not only is water quality a concern, there are also concerns about potential entrainment of larval sport fish and the banded killifish. The southwest bay is important fish nursery habitat and habitat for the rare banded killifish. Please see the appendix for more information concerning this option.

#### Pump From Fish Lake - Hypolimnetic Withdrawal

This option involves removing the degraded water in the deepest part of the lake (hypolimnion) and discharging it into the Wisconsin River. A hypolimnetic withdrawal project on Devil's Lake has been very successful for removing nutrients from the lake. This project would be similar to that project in terms of water quality benefits. Placing the intake pipe for the pumping system could be beneficial for the system since degraded water would be removed from the Mud Lake and Fish Lake system. While degraded water quality would move from Mud Lake into Fish Lake during a hypolimnetic withdrawal, the result would be a net loss of phosphorus from the lake due to the significantly higher levels in the hypolimnion. If the pipe intake were to be placed at the deep part of the hypolimnion (~60 feet), potential fish entrainment and intake plugging would likely be minimized. A hypolimnetic withdrawal combined with reducing external nutrient sources would have a great benefit to the lake and would be consistent with the approved management plan (A Management Plan To Protect And Improve The Fish Lake Ecosystem 1996). At the time this proposal was considered, this option was rejected because of the expense of installing the pipe and reaching the hypolimnion.

#### Flood-proofing Threatened Structures

The affected homeowners have the option of flood-proofing their individual structures, and to a large extent this has already occurred. However, many property owners have opted to temporarily move out of their residences.

#### Find an industrial or commercial use for the extra water

Use of the water in an industrial process would be one way to remove water from the lake without diverting it to another water body. However, this would require a process that used extremely large volumes of water without producing a proportionate volume of wastewater. Supplemental water would need to be supplied by wells in drought periods. This option does not appear to be feasible at this time.

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## SUMMARY OF ISSUE IDENTIFICATION ACTIVITIES

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26. List agencies, citizen groups and individuals contacted regarding the project (include DNR personnel and title) and summarize public contacts, completed or proposed).
- 2001 Meetings with representatives from the Fish Lake Association, Roxbury and West Point Townships , Dane County and private citizens
  - 2002 Stakeholder issue identification process facilitated by UW Extension, Lower Wisconsin Riverway Board, State legislature inquiry and involvement. Meetings with representatives from USGS, the Fish Lake Association, Roxbury and West Point Township and private citizens
  - 2003 Meetings with representatives from the Fish Lake Association, Roxbury and West Point Townships and private citizens
  - 2006 Meetings with Lake District as part of Chapter 30 issuance process.
  - 2007 Meetings with the Fish, Mud, and Crystal Lake District to deal with permit issues regarding permit. Planning and design of infiltration cell design.
  - 2008 Meetings and discussions with the Fish, Mud, and Crystal Lake District to address issues concerning the infiltration cell discharge (failure) and emergency pumping approvals during the flooding that occurred. WPDES permit modification for discharge to the Wisconsin River.
  - 2009 Public hearing held on 1/22/09 regarding discharge to the Wisconsin River and Chapter 30 request for modification. Numerous contacts with the Fish, Mud, and Crystal Lake District, Dane and Columbia County, Lower Wisconsin Riverway Board, news media, and private media regarding the permit application/modification for pumping directly to the Wisconsin River.

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DECISION (This decision is not final until certified by the appropriate authority)

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In accordance with s. 1.11, Stats., and Ch. NR 150, Adm. Code, the Department is authorized and required to determine whether it has complied with s.1.11, Stats., and Ch. NR 150, Wis. Adm. Code.

Complete either A or B below:

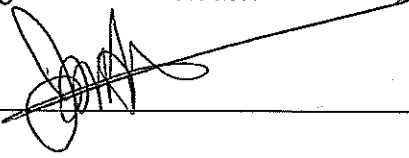
A. EIS Process Not Required



The attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action which would significantly affect the quality of the human environment. In my opinion, therefore, an environmental impact statement is not required prior to final action by the Department.

B. Major Action Requiring the Full EIS Process ☐

The proposal is of such magnitude and complexity with such considerable and important impacts on the quality of the human environment that it constitutes a major action significantly affecting the quality of the human environment.

Signature of Evaluator 	Date Signed 4/16/09
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Number of responses to news release or other notice:

Certified to be in compliance with WEPA	
Environmental Analysis and Liaison Program Staff	Date Signed

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NOTICE OF APPEAL RIGHTS

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If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the



decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.

Note: Not all Department decisions respecting environmental impact, such as those involving solid waste or hazardous waste facilities under sections 144.43 to 144.47 and 144.60 to 144.74, Stats., are subject to the contested case hearing provisions of section 227.42, Stats.

This notice is provided pursuant to section 227.48(2), Stats.

## Environmental Assessment Appendix

## **A. Additional Questions From the Comments at the Public Hearing**

Every attempt was made to address the questions/comments from the public hearing in the body of the E, below are additional questions/comments and responses.

### ***Will this discharge hurt the water quality of the Wisconsin River?***

Because the Department has recommended limits that are more restrictive than Fish and Aquatic Life Standards (which uses assimilative capacity as the basis for this discharge limit), the discharge is not likely to harm the biota of the Wisconsin River, in accordance with NR 207. The discharge of the pumping from Mud and Fish Lakes represents less than 1% of the flow of the Wisconsin River at "low flow" conditions.

### ***Will this set a bad precedent by facilitating new discharges to the Wisconsin River and the lowering of Exceptional Waters standards elsewhere?***

The precedent already exists in NR 207, which has a process for allowing using the assimilative capacity limit for discharges needed to address health, economic, or social issues.

### ***Pumping may not be the best option--what about more effective solutions to this problem?***

Other options have been described and evaluated in this document elsewhere. It is recognized that pumping may be limited in its ability to lower Fish and Crystal Lakes because of unknown future climatic and regional groundwater patterns. According to the county and state health agencies, temporary holding tanks do not adequately address the long-term public health issue.

Since the properties on Fish Lake are within the Dane County Lussier Park, they are eligible to be purchased by Dane County at fair market value. This would address the issue of dealing with flooded residences on Fish Lake. Roads would then need to be raised to deal with infrastructure issues. This would be a continuing cost for town governments and their citizens.

### ***The permit does not have adequate enforcement requirements and it does not require bacteria monitoring despite the public health problem.***

The permit will include required monitoring as determined by WPDES regulations and policy. The public health issue that is being addressed pertains to potential groundwater contamination and impacts to private wells around Fish Lake - not surface water impact to the Wisconsin River. Bacterial monitoring of Fish Lake conducted by the Department in 2008 indicated bacterial levels were low enough not to warrant further monitoring.

### ***The Department has not followed NR 301 and the public notice process did not state the purpose or statutory authority for conducting the hearing.***

NR 310 does not apply to this case. It is for enforcement of non permitted activities and after-the-fact permits. This was a permitted project.

The public notice does state the purpose for the hearing and cites the appropriate regulation for conducting the hearing.

***Will this threaten the Lower Wisconsin River with invasive species?***

Invasive species transfer is much less likely from the Lakes than from the upper two-thirds of the Wisconsin River watershed; however invasive species transfer is a legitimate concern because any transfer of water between water bodies possess this risk.

***The USGS groundwater model and study, which formed the basis for recommending pumping, is inadequate.***

The USGS study referred to is the best available source of information regarding the effectiveness of pumping. It is acknowledged that the study is based on weather patterns from the 1990s and it is unknown what those weather patterns will be like in the future. The effectiveness of future pumping is therefore also unknown but pumping data from 2008 suggests that pumping may provide some lowering of lake levels.

***The public health issue is questionable and we need additional data to support that there is a real public health problem before a permit is issued based on Fish and Aquatic Life (FAL) effluent limits.***

The Department is relying on the judgment of the appropriate public health professionals, the Dane County Dept. of Human Services, which identified a public health problem at Fish Lake due to flooded private septic systems. Please see the appendix for the support from local and state agencies for concern over the health issue. According to NR 207, addressing a public health or economic issue allows the Department to establish effluent limits based on less restrictive FAL procedures rather than requiring a discharge to meet background pollutant concentrations

***Have all chapter 30 Requirements been met?***

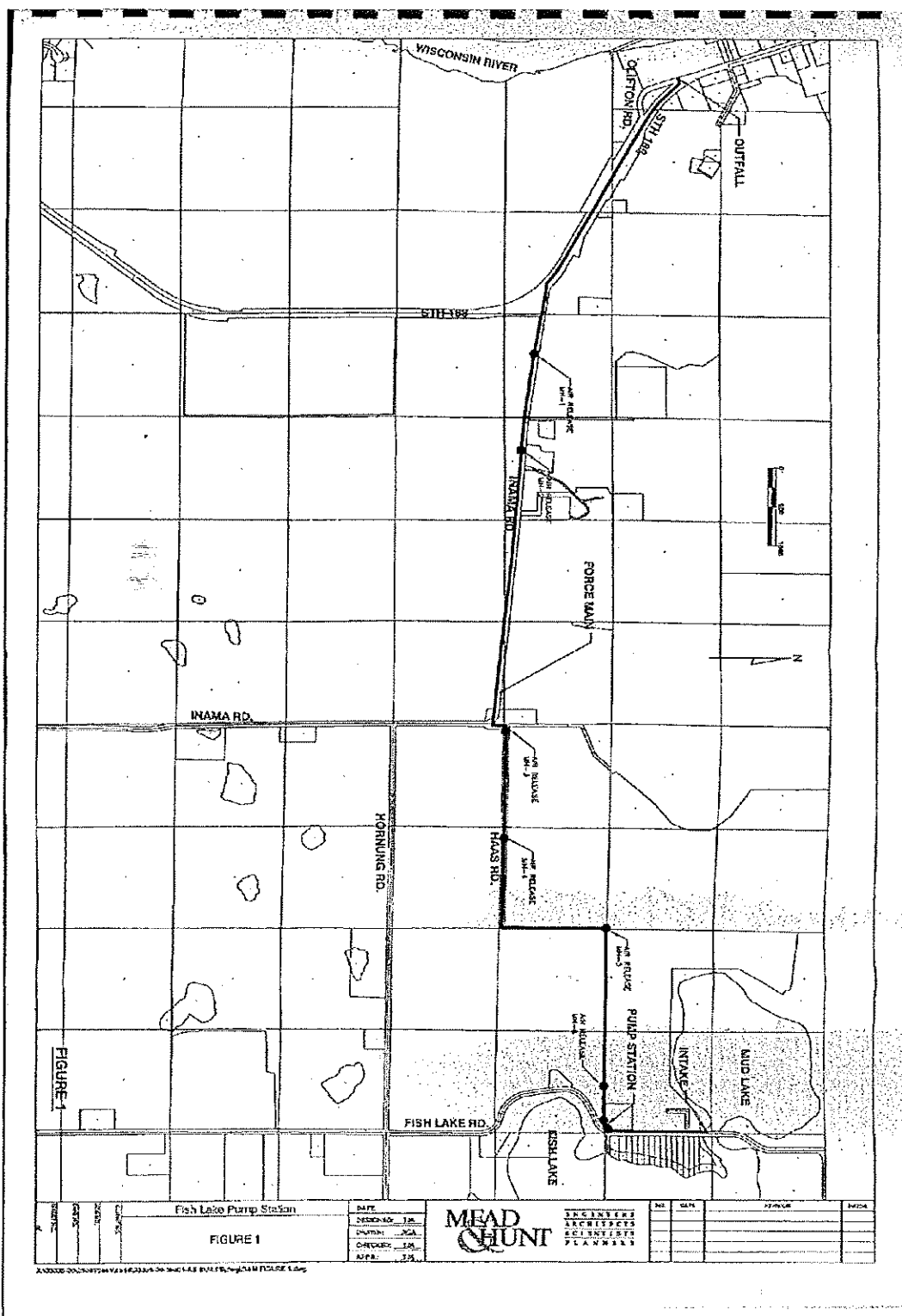
The Department has the original Ch. 30 permit application and a letter from the permittee requesting modification of the existing permit.

Environmental Analyses were not done for the original Ch. 30 permit or subsequent modifications because the applicable regulations did not require them.

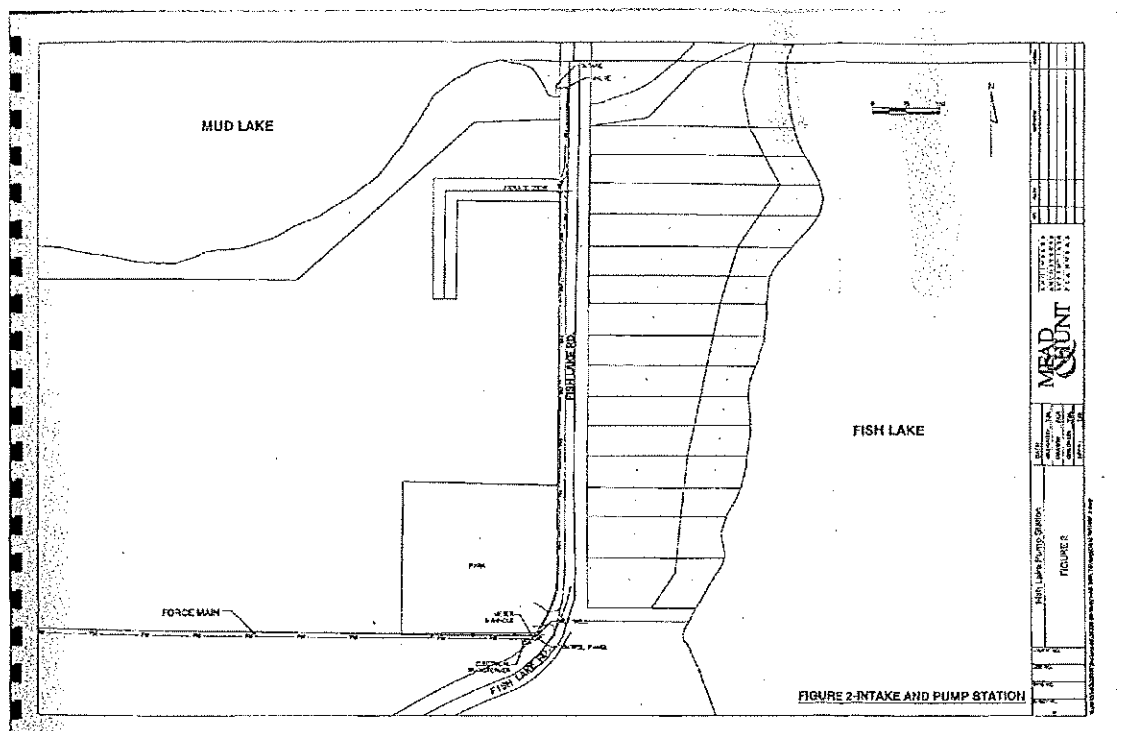
Ch. 30.18 requirements, regarding diversions, do not apply to the proposed pumping because it is not a diversion according that code's definition.

DNR staff has reviewed impacts to rare species from the proposed pumping and determined that the Higgins Eye Pearly Mussel was the only species of concern. Staff subsequently learned that this mussel was located upstream of, rather than near, the proposed outfall to the River, so impact on this species is not likely to be a concern.

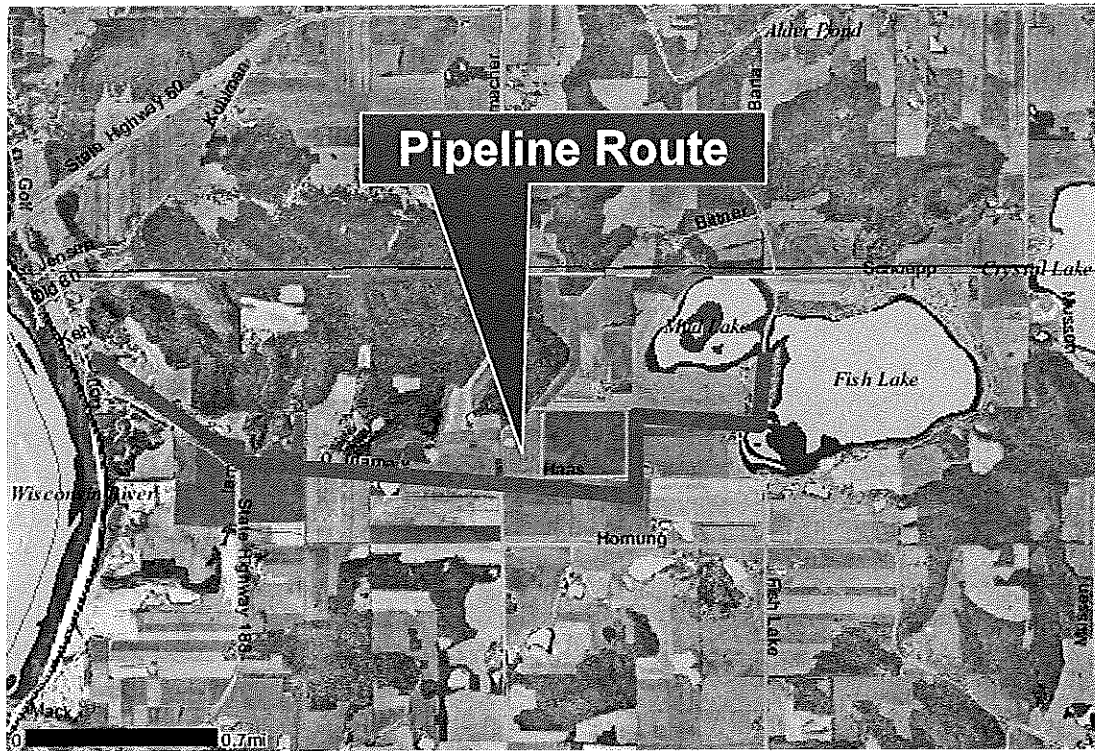
B. Route of Pipeline From Mud Lake to the Wisconsin River.



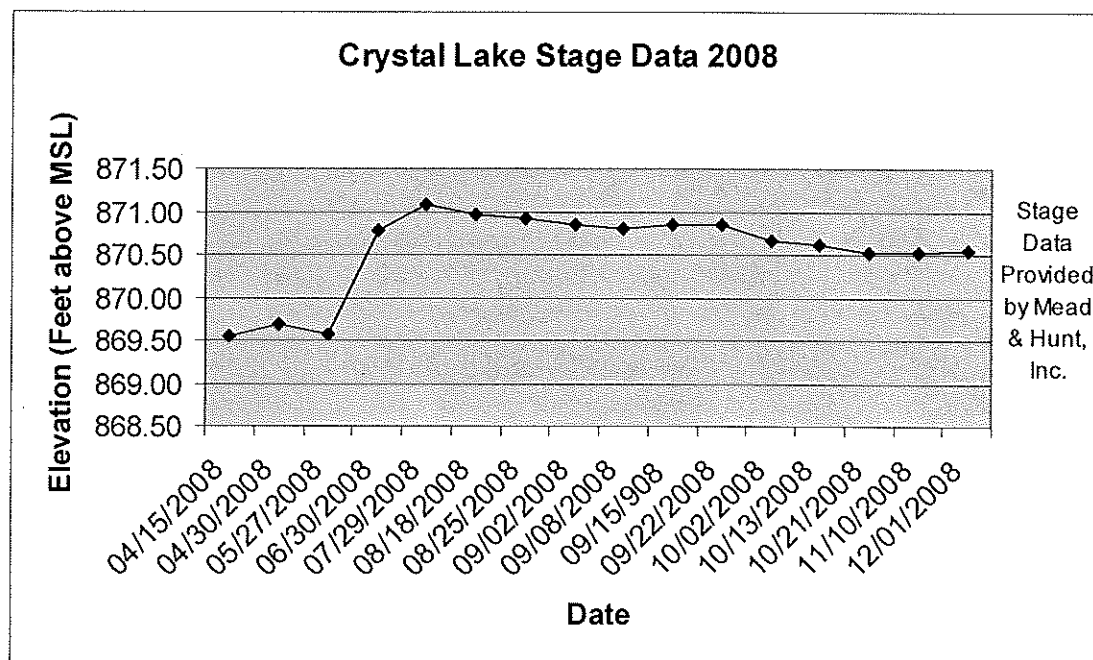
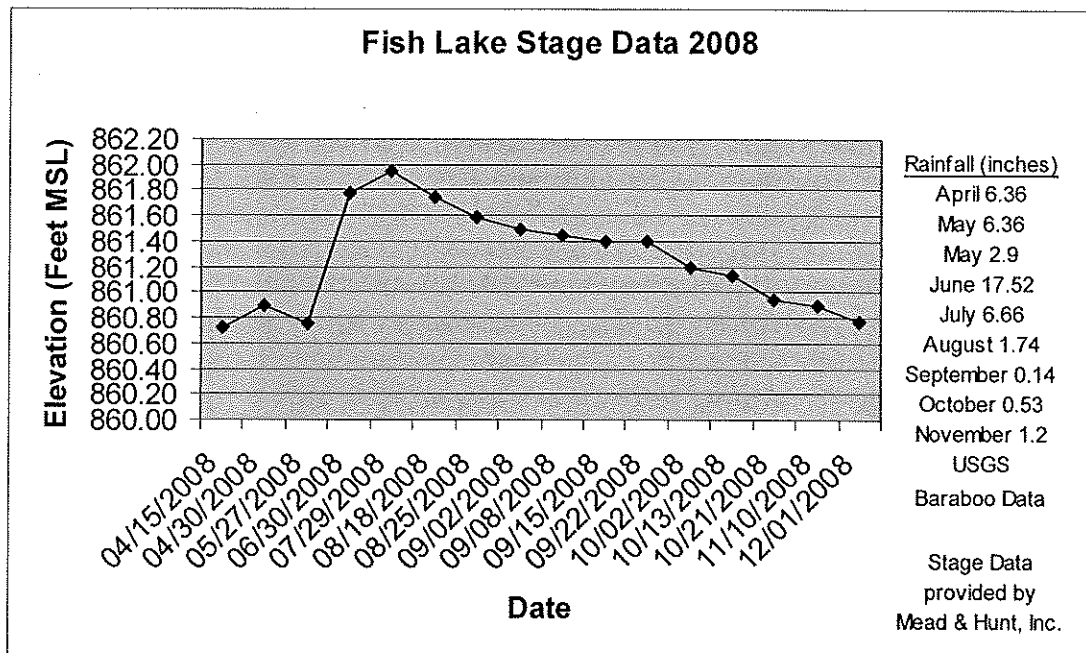
### C. Detailed Map of Pump Location on Mud Lake



D. Map of Pipeline From Fish Lake to the Wisconsin River



# E. Fish Lake and Crystal Lake Stage Data 2008





F. Summary of Lake Level Data

## Lake Level Data

	Fish Lake	Crystal Lake
1974	854.00 msl	863.00 msl
July 29, 2008	861.95 msl	871.09 msl
Dec 01, 2008	860.77 msl	870.55 msl

G. Summary of Water Quality Monitoring Data

## Summary of Water Quality Monitoring

Parameter	Wisconsin River (upstream)	Lake Discharge at Clifton Road	Typical Stormwater Discharge
BOD (ppm)	3.3 (n=7)	3.7 (n=16)	-----
Total Suspended Solids (ppm)	12.8 (n=14)	20.5 (n=18)	100 - 400
Ammonia (ppm)	.22 (n=3)	.62 (n=10)	-----
Phosphorus (ppm)	.31 (n=5)	.18 (n=2)	0.3 – 1.0
pH	8.0 (n=12)	8.3 (n=14)	-----

## H. WDNR Letter Recommending Using Fish and Aquatic Life Limits due to Health Issues

State of Wisconsin

### CORRESPONDENCE/MEMORANDUM

DATE: Oct. 14, 2008

TO: Nasrin Mohajerani - SCR

FROM: Robert Liska -- SCR Permit Drafter *RL*

SUBJECT: Public Health Problem for Fish Lake Residents

South Central Region staff met on Sept. 23, 2008, to discuss issues related to reissuance of WPDES permit WI-0049964-01, for the Crystal, Fish and Mud Lake District. This permit, first issued June 1, 2002, contains effluent limits for the discharge of pumped lake water from the District to an Exceptional Resource Water, the Lower Wisconsin River. During this meeting, it was mentioned that Fish Lake residents, living on the east side of Fish Lake Road, have experienced high lake levels on their property for many years. (A 2002 U.S. Geological Survey study states that Fish Lake levels have risen nine feet since 1966.) We also discussed language in Wis. Admin. Code Ch. NR 207.03 (4)(a), which states that, "For a proposed new discharge which is needed to prevent or correct... a public health problem, water quality based effluent limitations shall be determined in accordance with sub. (6)", which requires effluent limits to be established by using requirements for Fish and Aquatic Life Waters.

Following our meeting, I spoke with Mike Griffin, Sanitarian for the Dane County Dept. of Human Services (DHS) who covers the Fish Lake area, about the public health impacts of high lake levels on Fish Lake. Mr. Griffin confirmed that high levels on Fish Lake have caused public health problems for residents along Fish Lake Road for many years by raising groundwater levels beneath the septic systems for these residents to unacceptable levels resulting in poor treatment of septage from these systems and an unacceptable risk to human health. To address this problem, DHS sent two letters to these residents, dated Sept. 10, 2002, which ordered them to convert their septic systems to temporary holding tanks in order to, "resolve the public health issues related to the rising lake level and resulting shallow groundwater level." Most of these residents have not yet converted to temporary holding tanks. The DHS file also shows that as recently as July 14 of this year, lake levels had reached the toe of several septic mound systems, flooded several of these residences and inundated holding tanks at several other residences.

Given the history of high lake levels on Fish Lake and the history of DHS involvement there with the resulting public health problem, I recommend that effluent limits for the reissuance of the Crystal, Fish and Mud Lake District permit be revised to reflect the necessity of providing a long term correction to the existing public health problem there by calculating new effluent limits for this permit based on Fish and Aquatic Life Waters according to NR 207.03 (4)(a).

cc: Diane Figiel -- WT/3

I. Dane County Division of Public Health Letter With Instructions Sent to Fish Lake Residences (individual address not shown).



KATHLEEN M. FALK  
DANE COUNTY EXECUTIVE

**Division of Public Health  
Environmental Health Section**

Director – Charity Eleson  
Division Administrator – Gareth R. Johnson

September 10, 2002

The state and county plumbing codes that pertain to private sewage systems require at least three feet of well drained soil beneath the infiltration surface of the soil absorption component of the system. Due to the rising level of Fish Lake, the private sewage system located on your property referenced above no longer meets this requirement. Therefore the system is a failing private sewage system as defined in s.145.245, Wis. Stats.

Our office has consulted with the Wisconsin Department of Commerce (DCOM) regarding the options that are available to correct the violation created by the rising groundwater level that is due to the rising lake level. The DCOM has agreed to allow the conversion of the existing system to a temporary holding tank. The system must be operated as a holding tank system until the lake level recedes to the shoreline that existed in 1997.

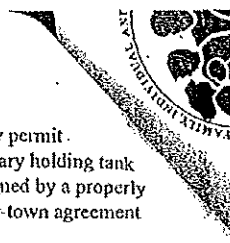
This letter shall serve as an ORDER to you from the Dane County Human Services Department to correct the violation created by the failing private sewage system on this property no later than October 11, 2002. Correcting the violation shall include all of the following:

1. The existing treatment tank and pump chamber, if applicable, must be evaluated for water tight condition to assure there is no leakage out of or into the tank. The tank(s) must also be evaluated for anchoring to assure that they will not be displaced by buoyancy forces when the contents are removed by a licensed septic waste hauler. This evaluation must be made by a properly licensed master plumber and must be included with the holding tank plan that is submitted to the Department of Commerce for review.
2. A plan for the conversion of the existing tank portions of the system to a temporary holding tank must be submitted to the DCOM, Safety and Buildings Division, for review. The plans must include all of the information required for holding tank plan review as set forth in Wisconsin Administrative Code ch Comm 83.

1202 Northport Drive, Madison, Wisconsin 53704 • (608) 242-6515 • FAX (608) 242-6256

6

I . Dane County Division of Public Health Letter With Instructions Sent to Fish Lake Residences  
(cont.)



3. After the required plan approval has been obtained you must submit a sanitary permit application to this office for the conversion of the existing system to a temporary holding tank system. The application must include the approved state plan and must be signed by a properly licensed master plumber. The application must also include a recorded owner-town agreement signed by the appropriate officials(s) of the Town of Roxbury.
4. After the sanitary permit has been obtained, the existing tank or tanks must be altered so as to prevent the discharge of sewage from the tank. If a pump chamber is part of the holding tank system, the outlet of the treatment tank will stay connected and prevention of sewage discharge will be achieved by removing the pump from the pump chamber. This work must be done by the master plumber that signs the sanitary permit application.
5. An approved alarm must be installed if the existing system does not already have an alarm mechanism installed.

The Dane County Board of Health has waived as much of the County sanitary permit fees as is possible in an effort to reduce the economic impact of this required action. There will be charges of \$61.00, which is required by s. 145.19(2) Wis. Stats., and a \$75.00 fee that is required to be submitted to the Department of Commerce for every sanitary permit that is issued. There will also be costs related to the recording of the owner-town agreement, the plan review by the Department of Commerce and the work of sealing the tank outlet or pulling the dosing pump.

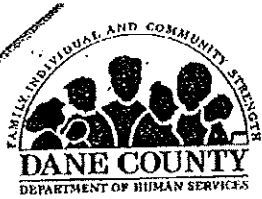
Your cooperation to comply with these requirements will be appreciated. If you have any questions regarding this situation or the County Code requirements, please contact me at 242-6515 between the hours of 7:45 a.m. and 4:30 p.m., Monday through Friday.

Sincerely,

James P. Clark, R.S., Director  
Environmental Health Section

cc: Sup. Vern Wendt, Dane County Supervisor,  
District 28 Rep. Eugene Hahn, State Assembly District 47  
Sen. Chuck Chvala, State Senate District 16  
Town of Roxbury

J. Dane County Division of Public Health Letter Concerning General Situation Sent to Fish Lake Residences (individual address not shown).



KATHLEEN M. FALK  
DANE COUNTY EXECUTIVE

**Division of Public Health  
Environmental Health Section**

Director -- Charity Eleson  
Division Administrator -- Gareth R. Johnson

September 10, 2002

One result of the meeting at the Roxbury Town Hall on Monday, August 23, 2002, was that I promised to review the prospects for the feasibility study of the proposal to draw down the lake level of Mud Lake, Fish Lake and Crystal Lake to determine whether we could defer issuing a corrective order to the property owners along the west end of Fish Lake. I have made that review and the results are as follows.

The information I gathered indicates that a feasibility study is likely to be approved and completed sometime in December of 2002 or January 2003. Prior to lowering the lake level to achieve the 3 foot separation necessary to meet the plumbing code criteria, many tasks need to be completed. These include an analysis of the feasibility study, construction plans, right-of-way agreements and easements, project bidding, construction and the pumping operation itself. We are informed this will take an extended period of time even if the feasibility study and analysis concludes the project is justified. The risk related to the discharge of untreated or partially treated sewage from the existing systems cannot be allowed to remain for the extended period that would elapse even if the project is feasible.

Another factor I have considered, in the event the feasibility study determines that pumping is not a realistic option, is what does this imply for the Fish Lake property owners? The reason we agreed to give this issue more thought was the concern put forth by one of the owners that this would mean that the money put into converting a system to a temporary holding tank would then have been wasted. In one sense, that could be true, but only in the event that someone intended to abandon his/her property if pumping was determined not to be feasible. If we assume this is not the intent of the owners, then money spent to convert a septic system to a holding tank will continue to offer a longer-term solution to the problem of rising water levels.

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## J. Dane County Division of Public Health Letter Concerning General Situation Sent to Fish Lake Residences (individual address not shown). (cont..)

There are some cautions I need to offer on this last point. First, as was discussed at the meeting on August 23, when a home is served by a holding tank, the tank must be pumped out every time it fills. The frequency of pumping will be determined by the amount of water a household uses. This can represent a significant ongoing expense. It can also force a family to make major changes in the way they use water. Many households with holding tanks choose not to do laundry at home, for example, opting to use a laundromat instead.

There are no viable available options that can be implemented in time to provide an acceptable alternative solution to this predicament for the near future. Clearly, there is no short term option that can run municipal sewer lines to Fish Lake, and the cost of that alternative would be exceedingly high even if it were available. The option of a 'cluster' septic system might be technically feasible, but the costs of the system design, purchasing land on which to install it and the installation itself would again be at great expense to the affected property owners. This would also take a significant amount of time to accomplish, which makes it a potential long-term solution but not adequate as a short-term correction.

In light of these considerations, I am forced to conclude that a delay in the conversion of your existing private sewage system to a code complying system is not warranted. I consider it critical that we take steps now to ensure that your existing failing system does not contribute to further contamination of either Fish Lake or the groundwater in proximity to the lake. Therefore the corrective order that was discussed at the meeting at the Town Hall on August 23, 2002, is enclosed with this letter. The following information is being provided so you have a complete understanding of the actions that are necessary to resolve the public health issues related to the rising lake level and resulting shallow groundwater level.

The conversion of the existing private sewage system to a temporary holding tank requires an approval from the Wisconsin Department of Commerce, Safety & Buildings Division. The information that must be submitted by your licensed master plumber, architect, engineer or certified system designer must include 1.) a diagram of the location of the existing tank or tanks in relation to buildings, water wells, etc., 2.) a cross section of the tank or tanks showing the size, 3.) evidence to verify that the tank(s) and all associated joints on risers, etc., are watertight and 4.) evidence to verify that the tank(s) are adequately anchored to withstand the hydrostatic pressures that exist due to the groundwater conditions. If the tank(s) are not watertight and/or are not properly anchored, the plan must include information about the work that will be done to make them watertight as well as how they will be anchored to meet the code requirements.

The information that was shared by the other experts we contacted about this conversion indicated that the expenses related to doing the necessary evaluation of the existing tanks will likely be significant. In addition, the work necessary to retroactively seal or adequately anchor the tanks is also likely to be a significant cost. I am sure you are aware that if it becomes necessary to excavate to provide the necessary waterproofing or anchoring, the soil moisture and the sandy soil will combine to make the work very difficult.

After the necessary plan approval is granted, your licensed master plumber will need to submit a sanitary permit application to the Dane County Environmental Health office. The Dane County Board of Health has waived all portions of the sanitary permit fee that otherwise would apply. The permit fee will therefore be the minimum required by state statute (\$61.00) plus the amount required by the Department of Commerce (\$75.00) for a total of \$136.00.

J. Dane County Division of Public Health Letter Concerning General Situation Sent to Fish Lake Residences (individual address not shown). (cont..)


The conversion of your system will include any anchoring or waterproofing that is found to be necessary, plus the removal of the existing sewage pump from the pump chamber. The existing high water alarm will serve as the alarm that is required of all holding tank installations. There will not be a need to make further adaptations after this is completed until such time as the lake levels recede and an approval to reconnect to the existing soil absorption component can be granted. The expenses you will incur in this action will not be wasted if the lake level recedes or remains relatively static at the current level.

We are calling this a temporary conversion since we are not certain about the future of the lake level. If there is no intervention and the lake levels continue to rise, your dwelling may actually be impacted by lake water. If the dwelling is found to be unfit for human habitation due to the intrusion of lake water, the existing private sewage system may then have to be totally abandoned. This will be a decision that cannot be made until such an event becomes reality, but in all fairness this should be something that you factor into your current decision of how to proceed.

We understand the situation that has created the problem here is the result of forces outside the control of any of us. The information we are providing is intended to provide a basis for your understanding that the risks posed to public health and groundwater, from the improperly operating private sewage system, create the need to modify the system so as to meet the necessary health and safety standards.

Your cooperation to comply with these requirements will be appreciated. If you have any questions regarding this situation or the County Code requirements, please contact me at 242-6515 between the hours of 7:45 a.m. and 4:30 p.m., Monday through Friday.

Sincerely,

  
Gareth Johnson, Administrator  
Public Health Division  
Dane County Human Services Department

cc: Sup. Vern Wendt, Dane County Supervisor, District 28  
Rep. Eugene Hahn, State Assembly District 47  
Sen. Chuck Chvala, State Senate District 16  
Town of Roxbury



# K. Letter From Wisconsin Department of Health Services Regarding Health Issues Pertaining to Flooded Residences at Fish and Crystal Lakes



Jim Doyle  
Governor

Karen E. Timberlake  
Secretary

State of Wisconsin

Department of Health Services

DIVISION OF PUBLIC HEALTH

1 WEST WILSON STREET  
P.O. BOX 2659  
MADISON, WI 53701-2659

608-266-1251  
FAX: 608-267-2832  
TTY: 888-701-1253  
dhs.wisconsin.gov

March 26, 2009

Andy Morton  
Wisconsin Department of Natural Resources  
Dodgeville Service Center  
1500 North Johns Str.  
Dodgeville, WI 53533

Dear Mr. Morton:

**RE: Potential Public Health Problems caused by flooding**

The Division of Public Health (DPH) recognizes that the flooding of homes and businesses has the potential to cause numerous public health problems. DPH expects that the shoreline homes and businesses surrounding Fish and Crystal Lakes impacted by the rising lake levels are experiencing one or more of these public health problems. The problems most often encountered during flooding events include the following:

**Drinking Water Concerns**

- The water from private wells that are or have been flooded is very likely to be contaminated. The safety of water supplies should be checked by testing for bacteria.

**Sewer/Waste Water Concerns**

- Typically constructed private septic systems that have been flooded are no longer reliable. Portable toilets or other appropriate facilities should be used. No one should have contact with water that has been contaminated with human wastes.
- Sewage can also back flow from private septic or municipal system through floor drains, toilets, etc. Any affected areas, such as basements, must be cleaned and disinfected with a chlorine solution. Anything that cannot be cleaned should be thrown out.

**Potential for Injuries**

- Electrical Safety - Homes that are flooded should have their power disconnected by the local utility.
- Emergency generators should **only** be used in well-ventilated areas. Otherwise, carbon monoxide, a colorless, odorless gas, can build up with fatal consequences.

*Wisconsin.gov*

K.. Letter From Wisconsin Department of Health Services Regarding Health  
Pertaining to Flooded Residences at Fish and Crystal Lakes (cont.)

Issues

- Physical Hazards - Avoid wading in water without proper foot protection. Broken glass, metal fragments, and other debris may be submerged in the flooded area. Cuts or puncture wounds are possible and tetanus vaccinations may be necessary.

**Increased Breeding Habitat for Insects/Mosquitoes**

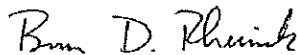
- Insects –Mosquitoes and other insects can transmit diseases such as the West Nile Virus and encephalitis.
- Stagnant water is a breeding place for disease carrying mosquitoes.

**Potential for Mold and Bacteria Growth**

- Many persons have allergies or asthma-like symptoms when exposed to these contaminants.
- For more information on mold go the Department of Health and Family Services website at <http://www.dhfs.state.wi.us/eh/>. Click on Human Health Hazards, and then click on mold.

If you have further questions, please feel free to contact me.

Sincerely,



Bruce Rheineck  
Health Assessor  
Division of Public Health  
Bureau of Environmental and Occupational Health  
(608) 267-3732  
[Bruce.Rheineck@Wisconsin.gov](mailto:Bruce.Rheineck@Wisconsin.gov)

CC: John Hausbeck – Public Health Madison and Dane County  
Barb Salna – Columbia County Health Department  
Robert Liska – Wisconsin Department of Natural Resources



